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ABSTRACT

As one in a series of test item collections developed by the Assessment and Evaluation Unit of the Directorate of Studies, items of value from previous tests are made available to teachers for the construction of pretests or posttests, reference tests for inter-class comparisons and general assignments. The collection was reviewed for content validity and reliability. Teachers are meant to base test item use on student ability and the particular program objectives. Number theory, fractions, decimals and percentages test items are presented. Sections also cover ratios and rates, and irrational numbers, indices and logarithms. Basic algebra test items are included. Answer keys can be separated from each page to construct a test by the guidelines provided. (CM)

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New South Wales **Department of Education**

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MATHEMATICS

LIBRARY OF TEST ITEMS

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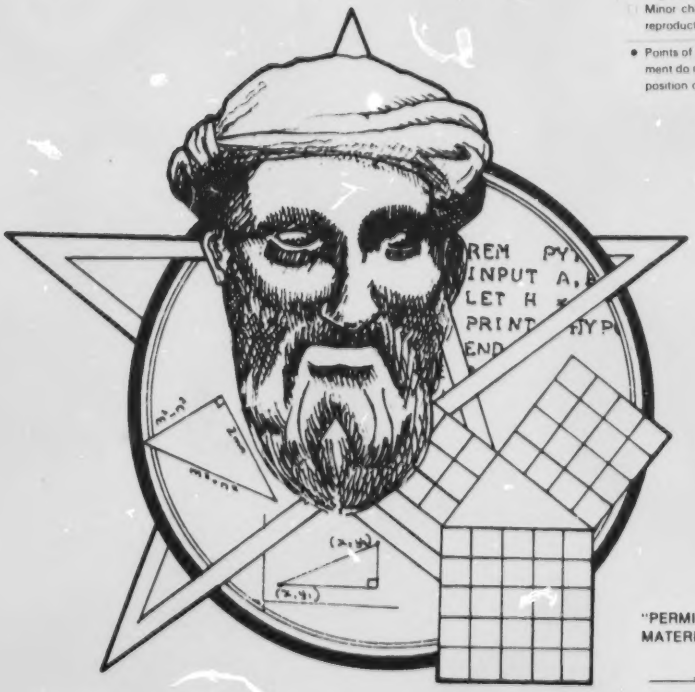

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TM 820 302

VOLUME ONE

CONTENTS

10. Number Theory
11. Fractions, Decimals
12. Percentages
13. Ratio, Rates
14. Surds, Indices, Logarithms
15. Basic Algebra

The following categories will be contained in the fourth instalment:

16. Equations, Inequalities, Quadratic Expressions, Functions
17. Graphs and Statistics
20. Non-metric Geometry, Symmetry
21. Transformation Geometry
22. Euclidean Geometry; Properties of Figures
23. Co-ordinate Geometry
24. Measurement and Mensuration
25. Trigonometry

MATHEMATICS LIBRARY OF TEST ITEMS

Third Instalment - July 1978

ISSUED AS VOLUME 1, NEW SERIES

Introduction:

This third instalment of Mathematics Items follows earlier issues in 1976 and 1977. Teachers' comments on the earlier instalments have been carefully considered, and have resulted in significant changes in the nature and presentation of items in this instalment. It is hoped that these changes will enable teachers to use the items more easily and effectively, and to find further uses for them.

Principles of layout and numbering have been reviewed, and items have been grouped together in a more systematic way. Items being submitted by teachers have shown a tendency to be more directly based on syllabus topics, a trend evident in this instalment.

It is again stressed that the function of this Collection of Test Items is to provide teachers with an increasingly useful resource, which, because of the time and expertise involved in its development, they would not normally be in a position to develop themselves. This intended function is reflected in the nature of the suggestions made under the heading "Possible Uses". In no sense should the collection be regarded as defining either the scope or the difficulty level of what is to be taught.

Format

There has been continuing concern over the quantity of paper required to reproduce the items for classroom use. Items have therefore been compressed in area to an extent that any further compression would prejudice the quality of reproduction by methods available in schools. Item numbers have been included as unobtrusively as possible with each item as well as in the margin to facilitate reference to the keys, and also re-sorting of items after use.

Previous Instalments

Most of the items from the 1976 and 1977 instalments have been edited and substantially reduced in size. Only items from sections 11 - 15 of those instalments are included in this instalment. Remaining items will be re-issued in due course.

Content Organisation

Topics covered in each major content area have been changed slightly. The major categories are now:

10. Number Theory
11. Fractions, Decimals
12. Percentages
13. Ratio, Rates
14. Surds, Indices, Logarithms
15. Basic Alegebra
16. Equations, Inequalities, Quadratic Expressions, Functions
17. Graphs and Statistics
20. Non-metric Geometry, Symmetry

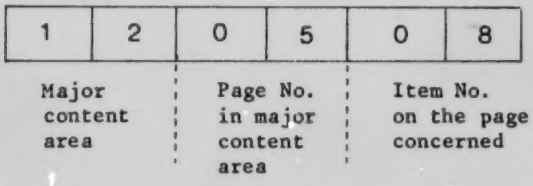
21. Transformation Geometry
22. Euclidean Geometry; Properties of Figures
23. Co-ordinate Geometry
24. Measurement and Mensuration
25. Trigonometry

Within each category, items testing the same topic have been grouped together so that each page contains items on a particular area of Syllabus content. Where a full page of such related items is not yet available, incomplete pages have been included. As sufficient suitable items come to hand, these pages will be completed, and issued as part of future instalments.

This instalment covers categories 10 - 15 (inclusive). The fourth instalment will cover categories 16 - 25 inclusive.

Numbering

A new system for numbering items has been adopted. Each item now has a 6 digit numeral, determined as follows



This will enable immediate location for reference, sorting etc.

Two pieces of information are provided with each item number in the margin:

(i) the key, or correct option; and

(ii) the difficulty rating (1-5) based on the data obtained during the pretest programme. A question rated "1" is a difficult item and would be suited to the top 10 to 20 percent of the state population. As the rating is increased the questions become easier. These values are not norms or goals, they are merely a guide to the teacher. Specific statistics are not provided, since these will vary from one school to another or from one use to the next.

Possible Uses

The following suggestions for using these items provide a guide to their intended function:

(i) on overhead transparencies for short review questions to begin lessons, or for classroom discussion;

(ii) for assembling topic "pre-tests" or "post-tests" which will indicate student needs and achievement;

(iii) for assembling across-the-form tests to be used as internal "reference tests" to gain inter-class comparisons;

(iv) for general purpose assignments.

Using the Item Collection

Two copies, punched for ring-binding, are being sent to each school - one for cutting up to produce "printing masters", and another to be left intact as a master file. If the cut-up items are used carefully and stored suitably, they should be able to be used many times for making printing masters. (See "Preparation of Printing Masters"). It is suggested that large envelopes be bound into the ring-binder to store cut-up items.

With similar items grouped together, it will be possible for teachers to utilise complete pages of items as printed. In this case, there is no need to cut off the margin - it can be folded under or covered up while the printing master is made.

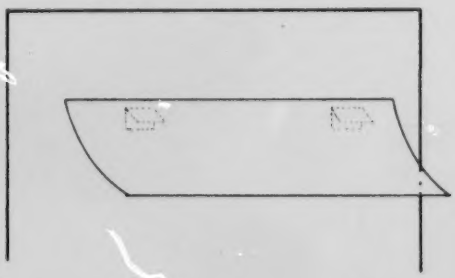
Preparation of Printing Masters

This method is recommended as it allows the prepared master to pass through a typewriter for the addition of page and question numbers etc., and prevents the electric scanner "reading" sticky tape patches and top edges of cut items.

1. Cut out items, cutting from the dotted line to the right hand edge. Always cut *very close to* and *below* the lines which separate questions.

2. Type your test heading on a blank page

3. Fix question 1 in position, "stamp-hinge" style:



4. Slide the top edge of Q.2 under the bottom edge of Q.1, and position Q.2 correctly.

5. Holding Q.2 in position, lift the bottom edge of Q.1 and tape Q.2 in position, so that when Q.1 is allowed to sit flat again, it completely covers the tape used to hold Q.2. Q.2 should be fastened by its top edge only.

6. Stick Q.3 in place as described for Q.2 in (4) and (5) above.

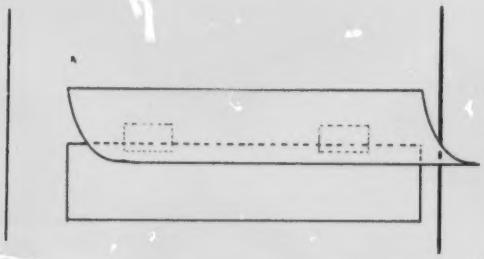
7. Repeat until page 1 is full.

8. Complete pages 2, 3 etc., until all items are positioned.

9. Type or hand write question numbers down the left-hand side.

10. Make the stencils, being careful to use the correct settings on the machine.

11. If, in step 5, only a narrow strip of sticky tape actually contacts the top of each item, it should be possible to separate tape and item for storage of items:



Contributions to the Library of Test Items

All items in this collection have been written by practising teachers in N.S.W., and have "survived" a pretest programme, as well as scrutiny by Item Review Panels, also consisting of practising teachers.

Further items are still sought and teachers who feel they could contribute suitable items are invited to submit a batch of 10 to the Subject Officer (Mathematics).

Comments and Criticisms

Comments and criticisms from teachers are welcome. All correspondence should be addressed to

The Subject Officer (Mathematics),
Directorate of Studies,
Department of Education,
Box 33 G.P.O.,
SYDNEY N.S.W. 2001

10 Number Theory

100101 C.5

Which of the following simplifies to 48?

A. $8 - 2 \times 8$ B. $4 + 4 \times 6$ C. $(4 + 4) \times 6$ D. $6 \times 3 + 6 \times 2$

100101

100102 C.5

Which of the following simplifies to 32?

A. $6 - 2 \times 8$ B. $3 + 5 \times 4$ C. $(3 + 5) \times 4$ D. $2 \times 4 + 8 \times 2$

100102

100103 B.5

Which expression does NOT equal 48?

A. $18 + 10 \times 3$ B. $8 - 2 \times 8$ C. $2 \times 8 \times 3$ D. $2 \times 18 + 4 \times 3$

100103

100104 C.5

Which of the following has the value 24?

A. $5 + 3 \times 3$ B. $(6 + 2) \times 8 - 5$ C. $4 \times 3 + 6 \times 2$ D. $144 \div 3 \times 2$

100104

100105 C.5 WHEN COPYING

$5 + 5^2$ simplifies to

A. 5^3 B. 100 C. 30 D. 15

100105

100106 A.5 OR CUT OFF

The sum of the three numbers 1479, 754 and 1803 is

A. 4036 B. 4026 C. 3936 D. 3036

100106

100107 A.5 FOLD UNDER, COVER UP,

Which element of the set $\{\neq, =, >, \nless\}$ when placed in the box makes $120 \square 11 \times 11$ a true statement?

A. $\neq$ B. $=$ C. $>$ D. $\nless$

100107

100108 B.5

A boy wrote 166×53 in mistake for 168×53. By how much was his answer too small?

A. 2 B. 106 C. 332 D. 336

100108

100109 D.3

The reciprocal of 7×8 is

A. 8×7 B. $\frac{7}{8}$ C. $\frac{8}{7}$ D. $\frac{1}{56}$

100109

100110 D.3

Which of the following is the largest?

A. $\frac{4}{9}$ B. $\frac{9}{25}$ C. $\frac{9}{16}$ D. $\frac{16}{25}$

100110

100201 If the two middle digits of 6248 were interchanged, the number would be

A. made smaller by 200.
B. made smaller by 180.
C. made larger by 180.
D. made larger by 200.

C.3

100201

100202 The reciprocal of the number $\frac{1}{1+\frac{1}{2}}$ is

A. $\frac{2}{3}$ B. $1\frac{1}{2}$ C. 2 D. none of these.

A.3

100202

100203 *A number is the multiplicative inverse of another number if the product of the two numbers is 1.*
Which of the following sets of numbers is the same as its set of multiplicative inverses?

A. $\{1,2,3\}$ B. $\{\frac{1}{2},1\}$ C. $\{\frac{1}{2},1,2\}$ D. $\{\frac{2}{3},2,3\}$

C.1

100203

FOLD UNDER, COVER UP, OR CUT OFF WHEN COUNTING

100201 If the two middle digits of 6248 were interchanged, the number would be

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C.3

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C.1

100203

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

100301 B.5

8692 rounded off to the nearest hundred is

A. 9000 B. 8700 C. 8690 D. 8600

100301

100302 C.5

592 673 rounded off to the nearest hundred is

A. 592 000 B. 592 600 C. 592 700 D. 593 000

100302

100303 C.5

547 600 rounded off to the nearest thousand is

A. 547 000 B. 547 500 C. 548 000 D. 500 000

100303

100304 C.5

867 526 rounded off to the nearest thousand is

A. 867 000 B. 867 500 C. 868 000 D. 870 000

100304

100305 B.5

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

Which one of the following is equivalent to 407?

A. $(4 \times 10) + (7 \times 1)$ C. $(4 + 0 + 7) \times (100)$

B. $(4 \times 100) + (0 \times 10) + (7 \times 1)$ D. $(4 \times 1) + (0 \times 10) + (7 \times 10)$

100305

100306 C.4

Which of the following is equivalent to $(2 \times 10^3) + (3 \times 10^2) + (4 \times 1)$?

A. 234 B. 2034 C. 2304 D. 2340

100306

100307 D.4

Which of the following is another way of expressing the number 2093 ?

A. $(2 \times 10^3) + (1 \times 10^2) + (9 \times 10) + (3 \times 1)$

B. $(2 \times 10^3) + (9 \times 10^2) + (3 \times 1)$

C. $(2 \times 10^2) + (9 \times 10) + (3 \times 1)$

D. $(2 \times 10^3) + (9 \times 10) + (3 \times 1)$

100307

100308 D.4

The place value of 7 in 239.472 is

A. 7 tens. B. 7 hundreds. C. 7 tenths. D. 7 hundredths.

100308

100309 C.4

The place value of 8 in 26.738 is

A. 8 hundredths. B. 8 hundreds. C. 8 thousandths. D. 8 thousands.

100309

100310 B.4

Which one of the following remains unchanged in value if the zero is left out?

A. 2.084 B. 3.480 C. 6.04 D. 270

100310

100401

How many hundreds in 4 000 000?

A. 400 B. 4000 C. 40 000 D. 400 000

C.3

100401

100402

$3 \times \frac{1}{10} + 5 \times \frac{1}{10^2} + 6 \times \frac{1}{10^3}$ is equivalent to

A. 0.0356 B. 0.3056 C. 0.3506 D. 0.356

D.3

100402

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

100501 Coloured beads are strung onto a wire in the following order: blue, green, red, yellow. If this pattern is continued, the 247th bead would be

A. blue. B. green. C. red. D. yellow.

C.4 100501

100502 There are three steeples, each with a bell in it. One bell rings every 3 seconds, another every 4 seconds, and the third every 6 seconds.
If they start ringing together, after how many seconds will they next ring together?

A. 12 B. 18 C. 24 D. 72

A.3 100502

100503 Seven men, M, N, O, P, Q, R and S, are to take turns in that order to work for one week as night porter in a hospital, starting the first week of the year.
Which of the following statements would be correct?

A. For R to draw the 37th week we should give week 1 to M.

B. For O to draw the 16th week we should give week 1 to O.

C. For Q to draw the 23rd week we should give week 1 to P.

D. For N to draw the 46th week we should give week 1 to S.

C.3 100503

FOLD UNDER, COVER UP OR CUT OFF WHEN COPYING

100504 The first four triangular numbers are:

The sixth triangular number is

A. 15 B. 19 C. 21 D. 20

C.3 100504

100505 If n is any integer, which of the following will <u>always</u> give a set of four consecutive integers?

A. $n, 2n, 3n, 4n$

B. $n, \frac{n}{2}, \frac{n}{3}, \frac{n}{4}$

C. n, n^2, n^3, n^4

D. $n+1, n+2, n+3, n+4$

D.3 100505

100506 A set of numbers is obtained this way:
For the first number : square 1, add 2 i.e. $1^2 + 2 = 3$
For the second number : square 2, add 3 i.e. $2^2 + 3 = 7$
For the third number : square 3, add 4 i.e. $3^2 + 4 = 13$
The n^{th} number in the set is

A. $n^2 + n$ B. $n^2 + m$ C. $(n+1)^2$ D. $n^2 + (n+1)$

D.2 100506

100601 Given that $(n+\frac{1}{2})^2 = n^2 + n + \frac{1}{4} = n(n+1) + \frac{1}{4}$, it follows that $(17\frac{1}{2})^2 =$

A. $17^2 + \frac{1}{4}$ B. $17 \times 18 + \frac{1}{4}$ C. $17 \times 18\frac{1}{4}$ D. $17^2 + (\frac{1}{2})^2$

B.1 100601

100602 Given that 1! means 1
2! means 2×1
3! means $3 \times 2 \times 1$
.....
n! means $n(n-1)(n-2) \ldots 4 \times 3 \times 2 \times 1$

then $\frac{9!}{3!}$ would be equal to

A. $9 \times 8 \times 7 \times 6 \times 5 \times 4$ C. $3 \times 2 \times 1$

B. 3 D. $6 \times 5 \times 4 \times 3 \times 2 \times 1$

A.1 100602

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

100701 If we represent two real numbers, r and s, on the number line, r is greater than s if

A. s lies to the left of zero.
B. r is further from zero.
C. s lies to the right of r.
D. r lies to the right of s.

D.4 100701

100702 If p, q, r and s are different positive integers, which of the following expressions has a different value to the other three expressions?

A. rs + pq B. qp + sr C. sr + pq D. qr + ps

D.2 100702

100703 A "perfect number" is an integer which is equal to the sum of all its factors except the number itself.
e.g. 6 is a perfect number, since 6 = 3 + 2 + 1. 12 is not a perfect number, since 12 ≠ 6 + 4 + 3 + 2 + 1.
Which of the following is a perfect number?

A. 32 B. 28 C. 24 D. 20

B.2 100703

100704 $a \times b = a + b$ whenever

A. $a = b = 1$ B. $a = b = 2$ C. $b = 0$ D. $a = b$

B.2 100704

100705 *The cube of a number is greater than its square.*
This statement is true for

A. all numbers
B. all positive numbers.
C. all numbers greater than 1.
D. all numbers less than -1 or greater than 1.

C.2 100705

100706 If a number is greater than its square, then the number can be

A. any number between -1 and 1.
B. any number between -1 and 0.
C. any number between 0 and 1.
D. none of these since a number cannot exceed its square.

C.1 100706

100707 A postman delivered 8 letters to four houses leaving at least one at each house. Which of the following statements must be true?

A. Each house received more than one.
B. No house received more than two.
C. No house received more than five.
D. One house received at least three.

C.2 100707

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

100801

In a certain football game, the only ways to score are 'tries' worth three points, and 'goals' worth two points. A team which scores seventeen points

A. must have scored five tries and one goal.

B. must have scored seven goals and one try.

C. may have scored its points in two different ways.

D. may have scored its points in more than two different ways.

D.1

100801

100802

If the cube of a number ends in 3, then the last digit of the number is

A. 3 B. 7 C. 9 D. none of the above.

B.1

100802

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

100901 If the highest common factor of two numbers is 9, then

A. both numbers must be larger than 9.

B. one number must be larger than 9.

C. one number must be a multiple of the other.

D. both numbers must be multiples of 9.

D.4 100901

100902 $3 \times 5 \times 7 \times 17 \times 29 \times 31 \times j = 3 \times 5 \times 17 \times 29 \times 31 \times 77$. j must equal

A. 7 B. 11 C. 15 D. 21

B.4 100902

100903 A certain number, when divided by 5 leaves a remainder of 2, and when divided by 6 leaves a remainder of 3. When the number is divided by 10, the remainder is

A. 7 B. 3 C. 2 D. not necessarily any of these.

A.3 100903

100904 Which of the following is true of the sum of any three consecutive integers?

A. It is exactly divisible by 3. C. It is odd.

B. It is exactly divisible by 5. D. It is even.

A.3 100904

100905 Which digit should replace *, so that the number 143*3 is divisible by 7?

A. 4 B. 6 C. 7 D. 9

A.3 100905

100906 If 3 is a factor of N, what is the smallest number greater than N which also has 3 as a factor?

A. $3N$ B. $N + 3$ C. N^2 D. $\frac{N}{3}$

B.3 100906

100907 If n is an integer greater than 2, then the number $n(n - 1)(n - 2)$ must be

I. an even number.
II. exactly divisible by 3.
III. exactly divisible by 6.

A. I only. B. II only. C. I and II only. D. I, II and III.

D.2 100907

100908 If the first of any five consecutive integers, is odd, which of the following statements is FALSE?

A. Their sum is odd.

B. Their product is odd.

C. One of the integers is divisible by five.

D. The third integer is the average of the first and fifth integers.

B.2 100908

101001

The sum of any three consecutive odd numbers is

I. odd
II. divisible by 3

A. I only is true.
B. II only is true.
C. Both I and II are true.
D. Neither I nor II is true.

101001

A.2

101002

If the remainder is 3 when the integer N is divided by 5, what is the remainder when 2N is divided by 5?

A. 1 B. 2 C. 3 D. 4

101002

A.2

101003

If a, b, c are multiples of 5, which of the following could be a perfect square?

A. $a^2 + b^2$ B. $ab + 7$ C. $bc + 2$ D. $abc + 3$

101003

A.2

101004

If the remainder is 2 when the integer n is divided by 6, which of the following is a multiple of 6?

A. 2n B. 3n C. 4n D. 5n

101004

B.1

101005

1,2,3,4,5 are all factors of a certain number. Which of the following need not also be a factor?

A. 6 B. 8 C. 10 D. 15

101005

B.1

101006

Which of $\sqrt{33\,124}$, $\sqrt{7938}$ simplifies to a whole number, given that:

$33\,124 = 2 \times 2 \times 7 \times 7 \times 13 \times 13$

$7938 = 2 \times 49 \times 81$

A. $\sqrt{33\,124}$ only.
B. $\sqrt{7938}$ only.
C. Both $\sqrt{33\,124}$ and $\sqrt{7938}$.
D. Neither $\sqrt{33\,124}$ nor $\sqrt{7938}$.

101006

A.1

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101101 Which of the following will produce an even number, no matter what whole number is put in place of Δ?

I. $2 \times \Delta - 1$
II. $2 \times \Delta + 1$
III. $2 \times \Delta + 2$

A. I only. B. II only. C. III only. D. I and II only.

C.5 101101

101102 If the E's stand for even numbers, and the O's stand for odd numbers, which of the following is NOT true?

A. $E + E + O + E + E = O$
B. $O + E + O + E + O = E$
C. $O + O + O + O + O + O = E$
D. $O \times (O + E) + O \times (O + O) = O$

B.3 101102

101103 Given that p and q are integers, and that

I. $p + q$ is even,
II. pq is odd, then

A. p and q are both odd.
B. p and q are both even.
C. one of the integers is odd, the other even.
D. statements I and II cannot occur together.

A.2 101103

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101104 Given that p and q are integers, and that

I. $p + q$ is odd,
II. pq is odd, then

A. p and q are both odd.
B. p and q are both even.
C. one of the integers is odd, the other even.
D. statements I and II cannot occur together.

D.2 101104

101105 Which one of the following operations with integers will never produce an integer?

A. even ÷ even B. even ÷ odd C. odd ÷ odd D. odd ÷ even

D.2 101105

101106 $a + b = c$, then a,b and c cannot all be

A. positive integers.
B. negative integers.
C. odd integers.
D. even integers.

C.1 101106

101107 If x is an integer and $\frac{x+3}{2}$ is also an integer, then x could be

A. any negative integer.
B. any even integer.
C. any odd integer.
D. any multiple of 3.

C.1 101107

101201

If m is positive and n is negative, which of the following is always true?

A. $m+n$ is positive.
B. $m+n$ is negative.
C. mn is positive.
D. mn is negative.

D.3

101201

101202

If p and q are negative numbers, which of the following is always negative?

A. $p+q$ B. $p-q$ C. $p \times q$ D. $p \div q$

A.2

101202

101203

Given that p is any positive number and q is any negative number, which of the following is always positive?

A. $p+q$ B. $p-q$ C. $p \times q$ D. $p \div q$

B.3

101203

101204

If $a > b > 0$ which of the following is negative?

A. $-b+a$ B. $-(b+a)$ C. $-(b-a)$ D. $(-b-a)^2$

B.3

101204

101205

If $p > 0$ and $q < 0$, which of the following must be true?

A. $p+q>0$ B. $p-q>0$ C. $pq>0$ D. $\frac{p}{q}>0$

B.3

101205

101206

If $p < 0$ and $q < 0$, which of the following must be true?

A. $p+q<0$ B. $p-q<0$ C. $pq<0$ D. $\frac{p}{q}<0$

A.3

101206

101207

If $a > 0$ and $b < 0$, which one of the following is always true?

A. $a+b>0$ B. $a+b<0$ C. $ab>0$ D. $ab<0$

D.3

101207

101208

If $a < 0 < b$, which of the following must be true?

A. $b-a>0$ B. $b+a>0$ C. $ab>0$ D. $a-b>0$

A.2

101208

101209

If $x < 0$ and $y > 0$, which of the following must be true?

A. $y-x>0$ B. $x+y>0$ C. $xy>0$ D. $x-y>0$

A.3

101209

101210

If $y = x^2$ and x is negative, which of the following could be true?

I. $y > x$
II. $y < x$
III. $y = x$

A. I only. B. II only. C. I or II only. D. I, II or III

A.3

101210

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101301 If $0 < x < y$, which of the following must be negative?

A. $x^2 - xy$ B. $-(x-y)^{-1}$ C. $\frac{xy - x^2}{x}$ D. $y^2 - 2xy + x^2$

A.2 101301

101302 If a and b are positive and $a > b$, then $\frac{1}{a} - \frac{1}{b}$ is

A. always positive.
B. always negative.
C. always between -1 and 1.
D. sometimes positive and sometimes negative.

B.1 101302

101303 If $0 < a < b$, then $\frac{a-b}{a+b}$ must be

A. positive.
B. negative.
C. either positive or zero.
D. either negative or zero.

D.1 101303

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101401 Which of the following is NOT a prime number?

A. 2 B. 7 C. 9 D. 13

C.3 101401

101402 If p is a prime number greater than 2, then

A. 3p + 1 is even.
B. 3p + 1 is odd.
C. 3p + 1 is prime.
D. 3p + 1 is both odd and prime.

A.3 101402

101403 Which of the following statements is true?

A. Two square numbers added together never make another square number.
B. Two prime numbers multiplied together sometimes form another prime number.
C. The last digit of a perfect square may be 8.
D. The square of an odd number is always an odd number.

D.3 101403

101404 k is a prime number greater than 2. Which expression could be prime for some values of k?

A. k + 1 B. k + 2 C. 2k D. k^2

B.2 101404

101405 The sum of any two prime numbers greater than 3 is

A. always an even number.
B. always an odd number.
C. sometimes a prime number.
D. sometimes even and sometimes odd.

A.2 101405

101406 a,b and c are integers greater than 1. Which of the following expressions could be a prime number?

A. a + a B. bc C. abc D. a + 1

D.2 101406

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101501 For any two real numbers, a and b, an operation * is defined by $(a) * (b) = 3ab^2$.
Using this definition, the value of $(2) * (-3)$ is

A. -11 B. -36 C. 45 D. 54

D.3 101501

101502 If ϕ is an operation such that $a \phi b = ab + 1$, then $(a \phi b) \phi c$ is equal to which of the following?

A. $abc + 1$ B. $abc + 2$ C. $abc + c + 1$ D. $abc + c + 2$

C.1 101502

101503 The operation indicated by * is such that $x * y = 2xy$. If $k * 3 = 2$, the value of k is

A. $\frac{1}{3}$ B. $\frac{2}{3}$ C. $\frac{3}{2}$ D. 3

A.1 101503

101504 An operation θ is defined by $x \theta y = xy + (x + y)$. An expression for $\frac{1}{p} \theta \frac{1}{q}$ is

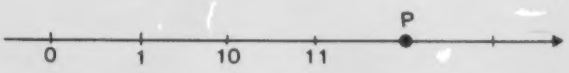
A. $\frac{1}{pq}$ B. $\frac{p+q}{pq}$ C. $\frac{2}{pq}$ D. $\frac{1+p+q}{pq}$

D.1 101504

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

10.16

101601



This number line is marked with base 2 numerals. The point P should be marked

A. 12 B. 20 C. 100 D. 110

C.1

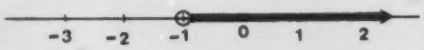
FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101701 In a survey of 50 cars, 20 have poor brakes,
32 have poor tyres,
6 have neither defect.
How many cars have both defects?

A. 8 B. 14 C. 44 D. 52

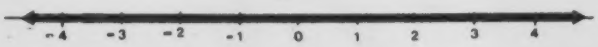
A.3 101701

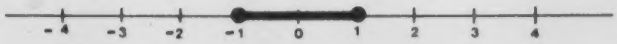
101702 If the graph of set A is

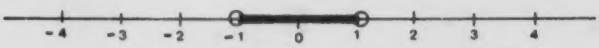


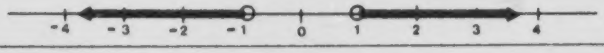
and the graph of set B is

then the graph of the set A ∩ B is

A. 

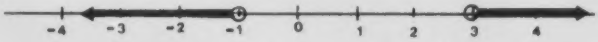
B. 

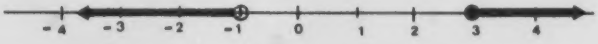
C. 

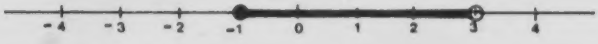
D. 

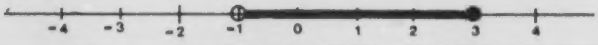
C.3 101702

101703 If P = {x : x > -1} and Q = {x : x ≤ 3}
which of the following graphs represents P ∩ Q?

A. 

B. 

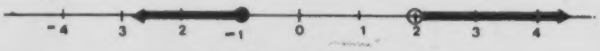
C. 

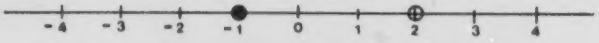
D. 

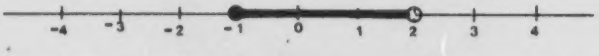
D.3 101703

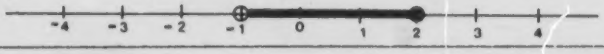
FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101704 If P = {x : x > -1} and Q = {x : x ≤ 2} then the graph of P ∩ Q is

A. 

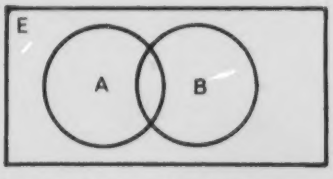
B. 

C. 

D. 

D.2 101704

101705

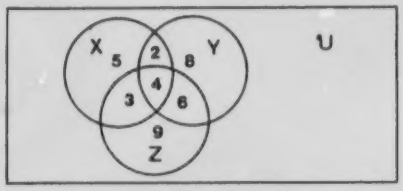


In the Venn diagram set E, the universal set, consists of seven dwarfs. Set A consists of dwarfs with beards, and set B consists of dwarfs with bandy legs. Five dwarfs have beards, while four dwarfs have bandy legs. One dwarf has neither a beard nor bandy legs.
How many dwarfs have BOTH a beard AND bandy legs?

A. 2 B. 3 C. 9 D. None

B.2 101705

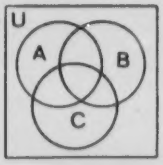
101801 In a certain town there are three TV channels, X,Y and Z. A group of 40 people were asked what channel(s) they had watched on the previous night and the results were recorded on the diagram below. How many people had watched BOTH channels X and Z?

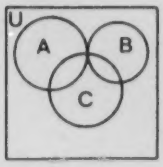


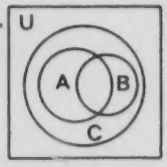
A. 3 B. 7 C. 17 D. 29

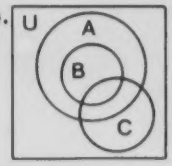
B.2 101801

101802 If U = set of all people, A = set of people with red hair, B = set of people with brown eyes and C = set of men, which of the following diagrams best represents these sets?

A. 

B. 

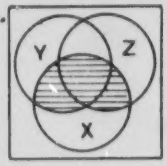
C. 

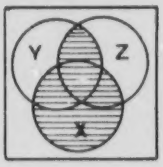
D. 

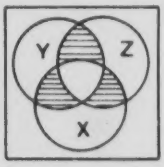
A.2 101802

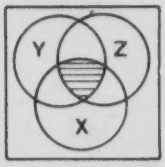
FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

101803 In which of the Venn diagrams below does the shaded area represent $X \cap (Y \cup Z)$?

A. 

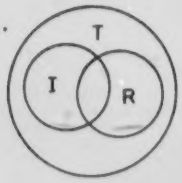
B. 

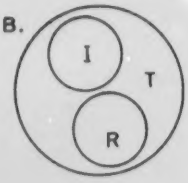
C. 

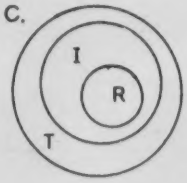
D. 

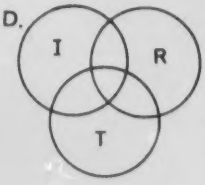
A.1 101803

101804 If T = {all triangles}, I = {isosceles triangles} and R ={right angled triangles},which of the following Venn diagrams illustrates the relationship between T, I and R?

A. 

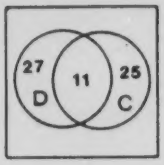
B. 

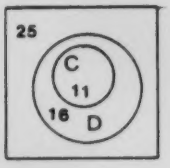
C. 

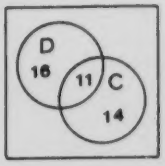
D. 

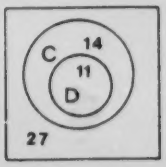
A.1 101804

101901 The Drama Club (D) with 27 members, and the Chess Club (C) with 25 members had lunch together. 52 lunches were ordered. Only 41 lunches were eaten, even though everyone turned up and had a lunch. Which diagram best illustrates what was overlooked?

A 

B 

C 

D 

C.1 101901

101902 *n(s) denotes the number of elements in the set s.*
If $n(P) = 10$, $n(Q) = 20$, $n(P \cap Q) = 5$ then $n(P \cup Q)$ equals

A. 35 B. 30 C. 25 D. 20

C.1 101902

101903 *This diagram could illustrate the relationship between*

A. the set P of even numbers and the set Q of real numbers.

B. the set P of numbers divisible by 3 and the set Q of even numbers.

C. the set P of numbers less than 10 and the set Q of numbers greater than 10.

D. the set P of rational numbers and the set Q of irrational numbers.

A.1 101903

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

11 Fractions, Decimals

110101 Which of these is equivalent to $\frac{4}{7}$?

A. $\frac{16}{49}$ B. $\frac{4+2}{7+2}$ C. $\frac{4\times 2}{7\times 2}$ D. $\frac{4-2}{7-2}$

C.3 110101

110102 $\frac{5+3}{6+2}$ has the same value as

A. $\frac{6+2}{5+3}$ B. $\frac{5+3}{6}+\frac{5+3}{2}$ C. $\frac{5}{6}+\frac{3}{2}$ D. $\frac{5+1}{2+2}$

A.2 110102

110103 Which of the following expressions is equal to $\frac{2}{3}$?

A. $\frac{\sqrt{2}}{\sqrt{3}}$ B. $\frac{2+5}{3+5}$ C. $\frac{2\div 5}{3\div 5}$ D. $\frac{2^2}{3^2}$

C.2 110103

110104 Which of the following is NOT equal to $3\frac{1}{2}$?

A. 3.5 B. $\frac{7}{2}$ C. $\frac{9}{4}$ D. $\frac{21}{6}$

C.5 110104

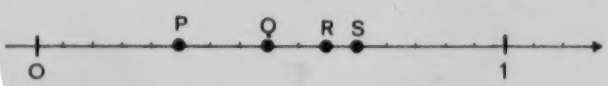
110105 Which of the following expressions is equal to -1?

A. $\frac{4\times 2}{4-2}$ B. $\frac{4+2}{4-2}$ C. $\frac{-4\times -2}{4+2}$ D. $\frac{-4-2}{4+2}$

D.3 110105

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

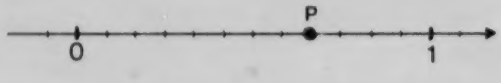
110201 Which one of the points on the number line below corresponds to $\frac{5}{8}$?



A. P B. Q C. R D. S

C.4 110201

110202



Which of the following fractions refers to point P on the number line above?

A. $\frac{2}{3}$ B. $\frac{3}{4}$ C. $\frac{8}{10}$ D. 8

A.4 110202

110203

O is the centre of the circle. What fraction of the circle is shaded?

A. $\frac{1}{6}$ C. $\frac{1}{3}$

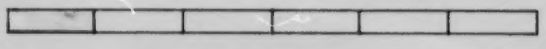
B. $\frac{1}{4}$ D. $\frac{2}{5}$

A.3 110203

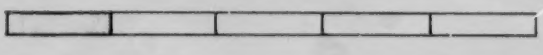
FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110204 On which of the diagrams below does the shaded part represent $\frac{1}{3}$ of $\frac{1}{2}$?

A.



B.



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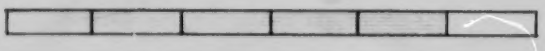
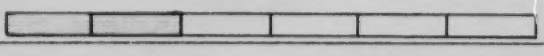


D.



A.3 110204

110205 In a class of 40 pupils, 24 are girls. What fraction of the class is boys?

A. $\frac{1}{3}$ B. $\frac{2}{5}$ C. $\frac{3}{5}$ D. $\frac{2}{3}$

B.3 110205

110206 Which of these fractions is greater than 0.64?

A. $\frac{2}{3}$ B. $\frac{3}{5}$ C. $\frac{5}{8}$ D. $\frac{11}{20}$

A.3 110206

110207 Knitting needle sizes are graded according to the diameter of the needle. If size 1 is a needle of diameter 1/32 cm, size 2 is a needle of diameter 2/32 cm, size 3 is 3/32 cm, then a needle of diameter 3/8 cm is

A. size 3. B. size 6. C. size 9. D. size 12.

D.3 110207

110301 Which of the following fractions lies between $\frac{1}{2}$ and $\frac{5}{9}$?

A. $\frac{2}{7}$ B. $\frac{19}{36}$ C. $\frac{2}{3}$ D. $\frac{3}{4}$

B.3 110301

110302 Which of the following fractions does NOT lie between $\frac{5}{12}$ and $\frac{3}{4}$?

A. $\frac{2}{3}$ B. $\frac{2}{5}$ C. $\frac{5}{8}$ D. $\frac{5}{10}$

B.2 110302

110303 Which of the following fractions lies between $\frac{1}{3}$ and $\frac{3}{7}$?

A. $\frac{2}{7}$ B. $\frac{2}{5}$ C. $\frac{2}{3}$ D. $\frac{7}{15}$

B.1 110303

110304 If 5 is added to both the numerator and denominator of a positive fraction which is less than 1, its value is

A. increased by 1.
B. unchanged.
C. decreased.
D. nearer 1.

D.1 110304

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110401 $\frac{1}{2} + \frac{3}{4} =$

A. $\frac{5}{4}$ B. 1 C. $\frac{2}{3}$ D. $\frac{3}{8}$

A.5 110401

110402 $\frac{1}{4} + \frac{2}{3} =$

A. $\frac{3}{7}$ B. $\frac{2}{12}$ C. $\frac{3}{12}$ D. $\frac{11}{12}$

D.5 110402

110403 $\frac{2}{3} + \frac{1}{5} =$

A. $\frac{3}{8}$ B. $\frac{3}{15}$ C. $\frac{11}{15}$ D. $\frac{13}{15}$

D.5 110403

110404 The sum of $\frac{3}{4}$ and $\frac{2}{3}$ is

A. $\frac{5}{12}$ B. $\frac{1}{2}$ C. $\frac{5}{7}$ D. $1\frac{5}{12}$

D.4 110404

FOLD UNDER. COVER UP, OR CUT OFF WHEN COPYING

110405 What is the difference between $1\frac{3}{4}$ and $2\frac{7}{8}$?

A. $\frac{5}{8}$ B. $1\frac{1}{8}$ C. $1\frac{5}{8}$ D. $4\frac{5}{8}$

B.4 110405

110406 $5\frac{1}{2} - 2\frac{3}{5} =$

A. $2\frac{9}{10}$ B. $3\frac{1}{10}$ C. $3\frac{2}{3}$ D. $3\frac{9}{10}$

A.3 110406

110407 $4\frac{3}{5} + 2\frac{5}{8}$ equals

A. $6\frac{8}{13}$ B. $6\frac{9}{40}$ C. $7\frac{8}{13}$ D. $7\frac{9}{40}$

D.3 110407

110501 $\frac{1}{2}$ of 20 is the same as $\frac{1}{4}$ of

A. 5 B. 10 C. 40 D. 80

C.5 110501

110502 $\frac{2}{7} \times \frac{5}{7} =$

A. $\frac{7}{7}$ B. $\frac{10}{7}$ C. $\frac{7}{14}$ D. $\frac{10}{49}$

D.4 110502

110503 $2\frac{1}{5} \times 4\frac{1}{2} =$

A. $8\frac{1}{10}$ B. $8\frac{2}{7}$ C. $9\frac{4}{5}$ D. $9\frac{9}{10}$

D.3 110503

110504 $\frac{2}{3} \times \frac{4}{5} \times \frac{10}{16} =$

A. $\frac{1}{3}$ B. $\frac{2}{3}$ C. $\frac{3}{2}$ D. 3

A.3 110504

110505 $12 \div \frac{1}{4} =$

A. 3 B. 4 C. 8 D. 48

D.4 110505

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110506 $\frac{\frac{2}{3}}{\frac{1}{2}}$ is equivalent to

A. $\frac{2}{3} \div \frac{1}{2}$ B. $\frac{2}{3} \times \frac{1}{2}$ C. $\frac{3}{2} \div \frac{1}{2}$ D. $\frac{3}{2} \times \frac{2}{1}$

A.4 110506

110507 $\frac{\frac{2}{3}}{\frac{1}{2}}$ is equivalent to

A. $\frac{3}{2} \times \frac{2}{1}$ B. $\frac{2}{3} \times \frac{1}{2}$ C. $\frac{3}{2} \times \frac{1}{2}$ D. $\frac{2}{3} \times \frac{2}{1}$

D.4 110507

110508 Which of the following is equivalent to $5\frac{1}{4} \div \frac{3}{7}$?

A. $\frac{4}{13} \times \frac{7}{3}$ B. $\frac{13}{4} \times \frac{3}{7}$ C. $\frac{4}{13} \times \frac{3}{7}$ D. $\frac{13}{4} \times \frac{7}{3}$

D.3 110508

110601 The value of $(6 \div \frac{1}{3}) \div 2$ is

A. 1 B. 4 C. 9 D. 36

C.3 110601

110602 Which of the following is equivalent to $\frac{1}{2} \div \frac{1}{2} \div \frac{1}{2}$?

A. $\frac{1}{2}$ B. $\frac{1}{8}$ C. 2 D. 8

C.2 110602

110603 Which one of the following is the correct value of $\frac{\frac{1}{2}}{\frac{3}{4}}$?

A. $\frac{1}{24}$ B. $\frac{1}{6}$ C. $\frac{3}{8}$ D. $\frac{2}{3}$

D.2 110603

110604 $(\frac{1}{2} + \frac{1}{4}) \times (\frac{1}{2} - \frac{1}{4}) =$

A. $\frac{3}{16}$ B. $\frac{3}{8}$ C. $\frac{1}{8}$ D. 0

A.3 110604

110605 $\frac{1}{2} \times \frac{2}{3} + 1\frac{1}{2} =$

A. $\frac{5}{12}$ B. $1\frac{1}{12}$ C. $1\frac{5}{6}$ D. $2\frac{1}{6}$

C.3 110605

110606 $\frac{9}{4} - \frac{1}{2} \div \frac{1}{4} =$

A. $\frac{3}{4}$ B. $\frac{4}{3}$ C. $\frac{3}{2}$ D. 2

D.3 110606

110607 $1\frac{1}{4} \times 2\frac{2}{5} - \frac{3}{5} =$

A. $2\frac{1}{4}$ B. $1\frac{4}{5}$ C. $2\frac{2}{5}$ D. $3\frac{1}{20}$

C.3 110607

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110701 After he has deducted his savings, a man has \$60 left from his weekly wages. He spends $\frac{1}{3}$ of this on food. He spends $\frac{1}{4}$ of the remainder on clothes, and \$8 per week on running his car. How much does he have left?

A. \$13.00 B. \$21.33 C. \$22.00 D. \$24.00

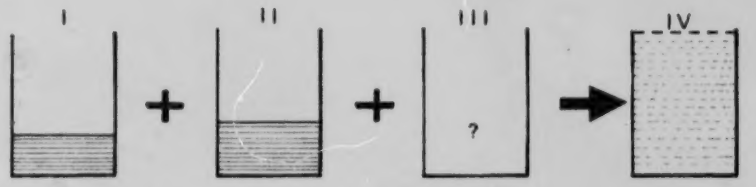
C.5 110701

110702 $1 \div (\frac{1}{2} + \frac{1}{4}) =$

A. $\frac{3}{4}$ B. $\frac{1}{6}$ C. 6 D. $1\frac{1}{3}$

D.4 110702

110703



Four identical containers, I,II,III and IV are shown. I is $\frac{1}{4}$ filled, and II is $\frac{2}{5}$ filled. What fraction must III contain so that when I,II and III are combined they can fill IV exactly?

A. $\frac{1}{5}$ B. $\frac{7}{20}$ C. $\frac{3}{10}$ D. $\frac{13}{20}$

B.4 110703

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110704 $\frac{1}{2} + \frac{2}{3} \times 1\frac{1}{2} =$

A. $\frac{9}{10}$ B. $1\frac{3}{7}$ C. $1\frac{1}{2}$ D. $1\frac{3}{4}$

C.3 110704

110705 Half of the sum of $\frac{2}{3}$ and $1\frac{1}{2}$ is equal to

A. $\frac{5}{12}$ B. $1\frac{1}{12}$ C. $1\frac{5}{6}$ D. $2\frac{1}{6}$

B.3 110705

110706 A plant grows $1\frac{1}{2}$ cm each month. If it is now 12 cm tall, how tall will it be in 18 months time?

A. 21 cm B. 27 cm C. 30 cm D. 39 cm

D.3 110706

110707 The reciprocal of $\frac{1}{2} + \frac{1}{3}$ is

A. 5 B. $\frac{5}{2}$ C. $\frac{6}{5}$ D. $\frac{5}{6}$

C.2 110707

110801 $\frac{3}{5}$ of a class are swimmers. $\frac{1}{4}$ of the swimmers learn lifesaving. The fraction of the total class learning lifesaving is

A. $\frac{1}{4}$ B. $\frac{3}{5}+\frac{1}{4}$ C. $\frac{3}{5}\div\frac{1}{4}$ D. $\frac{3}{5}\times\frac{1}{4}$

D.2 110801

110802 A man owned $\frac{3}{4}$ of a property but sold $\frac{2}{3}$ of his share. What part of the property does he still own?

A. $\frac{1}{12}$ B. $\frac{1}{4}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

B.1 110802

110803 If m and n are elements of $\{\frac{1}{1},\frac{1}{2},\frac{1}{3},\frac{1}{4}, \ldots\}$, which of the following will <u>always</u> represent an element of this set?

A. $m+n$ B. $m-n$ C. $m\times n$ D. $m\div n$

C.1 110803

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

110901 $\frac{1}{x} + \frac{1}{x} =$

A. $\frac{1}{2x}$ B. $\frac{2}{x}$ C. $\frac{2}{2x}$ D. $\frac{1}{x^2}$

B.3 110901

110902 Simplify $\frac{M}{8} + \frac{M}{2}$.

A. $\frac{M}{5}$ B. $\frac{3M}{8}$ C. $\frac{5M}{8}$ D. $\frac{M^2}{16}$

C.3 110902

110903 $\frac{1}{a} + \frac{1}{b} =$

A. $\frac{ab}{a+b}$ B. $\frac{2}{a+b}$ C. $\frac{a+b}{ab}$ D. $\frac{2}{ab}$

C.1 110903

110904 $\frac{a}{2} - \frac{1-a}{3}$ simplifies to

A. $\frac{a-2}{6}$ B. $\frac{2a-1}{6}$ C. $\frac{4a-2}{6}$ D. $\frac{5a-2}{6}$

D.1 110904

110905 $\frac{a}{b} + \frac{c}{d}$ is equivalent to

A. $\frac{a+c}{b+d}$ B. $\frac{a+c}{bd}$ C. $\frac{ad+bc}{bd}$ D. $\frac{ac}{bd}$

C.1 110905

FOLD UNDER, CAREFULLY CUT OFF WHEN COPYING

111001 $3 + \frac{7}{100} + \frac{6}{1000} =$

A. 3.76 B. 3.076 C. 3.706 D. 3.0706

B.4 111001

111002 Which of the following decimal expressions is equivalent to the sum of $\frac{2}{10}$ and $\frac{7}{10\ 000}$?

A. 0.27 B. 0.207 C. 0.2007 D. 0.0207

C.4 111002

111003 Which of the following is the best approximation for $8.91 \times \frac{43}{41}$?

A. 0.1 B. 1 C. 10 D. 100

C.4 111003

111004 Which of the following numbers remains unchanged in value when the zero is removed?

A. 2.480 B. 270 C. 6.04 D. 5.084

A.4 111004

111005 $\frac{31}{10} + \frac{4}{100} \cdot \frac{6}{10\ 000}$ is equivalent to

A. 3.146 B. 3.1406 C. 0.31406 D. 0.3506

B.3 111005

111006 The value of 0.7865 correct to two decimal places is

A. 0.78 B. 0.79 C. 0.786 D. 0.787

B.3 111006

111007 Which of the following is the largest?

A. 0.7 B. $\frac{73}{100}$ C. $7.2 \div 10$ D. $\frac{3}{4}$

D.5 111007

111008 Which of the following is NOT in descending order?

A. 4.04, 4.004, 0.404 C. 0.06, 0.009, 0.10

B. 2.1, 1.2, 1.12 D. 13.2, 12.3, 12.03

C.4 111008

111009 Which of the following is the largest?

A. 0.8 B. 0.85 C. 0.805 D. 0.815

B.3 111009

111010 Which of the following is the largest?

A. 0.60 B. 0.7 C. $(0.2)^2$ D. $(0.3)^3$

B.3 111010

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111101 $\frac{7}{8}$ is equivalent to

A. 0.78 B. 0.875 C. 0.725 D. 1.143

111101

B.3

111102 If $k = 2^m \times 5^n$, m and n are integers, $\frac{1}{k}$ will be a terminating decimal

A. only if n is even.
B. only if both m and n are even.
C. only if m = n.
D. for all values of m and n.

111102

D.2

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111201 Which is the best approximation for $\frac{601 \times 603}{602}$?

A. 1 B. 6 C. 60 D. 600

D.4 111201

111202 Which is the best approximation for 48.3×2.1?

A. 1.0 B. 10 C. 100 D. 1000

C.4 111202

111203 Which is the best approximation for 52.84×3.97?

A. 2 B. 20 C. 200 D. 2000

C.4 111203

111204 Which is the best approximation for 4.92×20.81?

A. 100 B. 1000 C. 10 000 D. 100 000

A.4 111204

111205 Which is the best approximation for 52.1×2.3?

A. 1.2 B. 12 C. 120 D. 1200

C.4 111205

111206 Which is the best approximation for 89.2×0.013?

A. 0.01 B. 0.1 C. 1.0 D. 10

C.3 111206

111207 Which is the best approximation for $\frac{75 \times 703}{7300}$?

A. 7.2 B. 72 C. 720 D. 7200

A.2 111207

111208 Which is the best approximation for $\frac{0.16}{0.081}$?

A. 2 B. 0.2 C. 0.02 D. 0.002

A.2 111208

111209 Which of the following is closest to $\frac{2}{3}$?

A. 0.667 B. 0.67 C. 0.66 D. 0.7

A.2 111209

111210 Which is the best approximation for 0.009×30.2?

A. 3 B. 0.3 C. 0.03 D. 0.003

B.1 111210

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111301 Which is the best approximation for $\frac{7.9}{0.8} \div 10^2$?

A. 0.001 B. 0.01 C. 0.1 D. 1

C.1 111301

111302 Which of the following is closest to the value of $10 \div 17.86$?

A. 1.786 B. 178.6 C. 0.6699 D. 55.99

C.2 111302

111303 If $x = \frac{1 - 0.001}{0.9}$, then x lies between

A. 1 and 2. B. 0.1 and 1. C. 0.01 and 0.1 D. 0 and 0.01

A.1 111303

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111401 B.5

3.54 - 1.46 =

A. 1.08 B. 2.08 C. 2.18 D. 5.00

111401

111402 A.4

7 - 1.34 =

A. 5.66 B. 5.76 C. 6.66 D. 6.76

111402

111403 B.4

8.3 - 4.35 =

A. 3.05 B. 3.95 C. 4.05 D. 4.95

111403

111404 B.4

7.2 - 3.56 =

A. 3.46 B. 3.64 C. 3.74 D. 4.64

111404

111405 B.4

12.2 - 6.25 =

A. 5.05 B. 5.95 C. 6.05 D. 6.95

111405

111406 A.4

6.4 - 4.62 =

A. 1.78 B. 1.88 C. 2.78 D. 2.88

111406

111407 A.4

5.3 - 3.52 =

A. 1.78 B. 1.88 C. 2.78 D. 2.88

111407

111408 B.4

7.36 - 2.45 =

A. 4.81 B. 4.91 C. 5.81 D. 5.91

111408

111409 A.4

15.012 - 9.08 =

A. 5.932 B. 6.004 C. 6.040 D. 6.932

111409

111410 C.2

4.4 - 7 =

A. 3.6 B. 2.6 C. -2.6 D. -3.6

111410

FOLD UNDER, COVER WP. OR CUT OFF WHEN COPYING

111501 $\frac{3}{4}$ of \$8.04 =

A. \$2.01 B. \$6.03 C. \$6.03 D. \$6.30

C.5 111501

111502 The number of centimetres in one inch is 2.54. How many centimetres are there in 100 inches?

A. 254 B. 25.4 C. 0.254 D. 0.0254

A.4 111502

111503 $0.05 \times 6 =$

A. 0.03 B. 0.3 C. 3.0 D. 30.0

B.4 111503

111504 $0.08 \times 8 =$

A. 0.064 B. 0.64 C. 6.4 D. 64

B.4 111504

111505 $0.03 \times 3 =$

A. 9.0 B. 0.9 C. 0.09 D. 0.009

C.4 111505

111506 $3 \times 0.3 \times 0.03 =$

A. 3.33 B. 2.7 C. 0.27 D. 0.027

D.3 111506

111507 If $63 \times 27 = 1701$ then $6.3 \times 0.27 =$

A. 0.01701 B. 0.1701 C. 1.701 D. 17.01

C.3 111507

111508 If $360 \times 214 = 77\ 040$ then $3.6 \times 21.4 =$

A. 7704.0 B. 770.4 C. 77.04 D. 7.704

C.3 111508

111509 Which of the following gives an answer of 6.4?

I. 1.6 multiplied by 0.4
II. 0.8 squared
III. 0.32 multiplied by 20
IV. 32 multiplied by 0.2

A. II only. C. III and IV only.

B. I and II only. D. I, II, III and IV.

C.3 111509

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111601 Given that $415 \times 263 = 109\,145$ then the value of $\frac{0.415 \times 26.3}{10^4}$ is

A. 10.9145 B. 0.109145 C. 0.0109145 D. 0.00109145

D.2 111601

111602 $(0.5)^2 =$

A. 0.10 B. 0.25 C. 1.0 D. 2.5

B.3 111602

111603 $(0.3)^2 =$

A. 0.06 B. 0.09 C. 0.6 D. 0.9

B.3 111603

111604 $(0.02)^3 =$

A. 0.8 B. 0.08 C. 0.008 D. 0.000008

D.2 111604

111605 Which of the following statements is true?

I. $0.27 = (0.3)^3$
II. $0.27 = 0.9 \times 0.3$

A. I only. B. II only. C. Both I and II. D. Neither I nor II.

B.2 111605

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111606 Which of the following is equivalent to $3.92 \div 0.86$?

A. $3920 \div 86$ B. $392 \div 86$ C. $39.2 \div 86$ D. $0.0392 \div 86$

B.4 111606

111607 $\frac{47.83}{32.8}$ is equivalent to

A. $\frac{4.783}{328}$ B. $\frac{4783}{328}$ C. $\frac{478.3}{3.28}$ D. $\frac{478.3}{328}$

D.3 111607

111608 $0.72 \div 0.09$ is equivalent to

A. $72 \div 9$ B. $720 \div 9$ C. $7.2 \div 9$ D. $72 \div 90$

A.3 111608

111609 $6.18 \div 0.3 =$

A. 0.206 B. 2.06 C. 2.6 D. 20.6

D.2 111609

111610 $0.56 \div 0.7 =$

A. 0.08 B. 0.8 C. 8 D. 80

B.2 111610

111701 $\frac{11.11}{11}$ is equal to

A. 1.1 B. 10.01 C. 1.01 D. 1.11

C.1 111701

111702 $100 \div 0.1 =$

A. 1 B. 10 C. 100 D. 1000

D.1 111702

111703 The value of $3 \div 0.04$ is

A. 0.75 B. 7.5 C. 75 D. 750

C.1 111703

111704 $\frac{(0.7)^2 \times (0.03)^2}{(0.07)^2 \times (0.3)^2} =$

A. 0.1 B. 0.01 C. 1.1 D. 1

D.1 111704

111705 Which of the following gives an answer of 0.2?

I. 0.4 divided by 0.2
II. 0.16 divided by 0.8

A. I only. B. II only. C. Both I and II. D. Neither I nor II.

B.1 111705

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

111706 Which of the following would give 0.9 for the answer?

I. $1.08 \div 1.2$
II. $2.7 \div 0.3$

A. I only. B. II only. C. Both I and II. D. Neither I nor II.

A.1 111706

111707 Which of the following are equivalent expressions?

I. $8.64 \div 4$
II. 7.2×0.3
III. $12.96 \div 0.06$

A. I and II only. C. II and III only.
B. I and III only. D. I, II and III.

A.1 111707

111708 When one number is divided by another number, the answer is 4.0. If one number is 0.2, the other could be

I. 0.8
II. 0.08
III. 0.05
IV. 0.5

A. I or III. B. II or III. C. I or IV. D. II or IV.

A.1 111708

111801 If $\sqrt{169} = 13$ and $\sqrt{16.9} = 4.111$ then $\sqrt{0.0169} =$

A. 1.3 B. 0.4111 C. 0.13 D. 0.0411

C.1 111801

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

12 Percentages

120101

6 per cent is equivalent to

A. 0.6 B. 0.06 C. 100 : 6 D. 6 : 10

B.4 120102

120102

Which of the following is NOT equivalent to 5%?

A. $\frac{1}{5}$ B. $\frac{5}{100}$ C. 0.05 D. $\frac{1}{20}$

A.4 120102

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

120201 A.4

17% of \$50 is

A. \$8.50 B. \$17.00 C. \$34.00 D. \$85.00

120201

120202 B.4

8% of \$100 =

A. 8 cents B. \$8 C. 80 cents D. \$80

120202

120203 C.4

1% of \$100 =

A. 1 cent B. 10 cents C. 100 cents D. 101 cents

120203

120204 C.4

30% of 120 kg is

A. 4 kg B. 25 kg C. 36 kg D. 40 kg

120204

120205 B.5

Which of the following is the closest approximation for 81% of 15?

A. 120 B. 12 C. 1.2 D. 0.012

120205

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

120206 B.5

200% of \$4 is

A. \$6 B. \$8 C. \$12 D. \$[illegible]00

120206

120207 C.5

A football team has won 3 of the 6 games already played. If it wins the next four games, what percentage of the games played will it then have won?

A. 40% B. 50% C. 70% D. 75%

120207

120208 D.5

A carpet, damaged in a rain storm, was reduced from \$200 to \$150. Its price was discounted by

A. 75% B. 50% C. $33\frac{1}{3}\%$ D. 25%

120208

120209 D.4

If 80 is 20% of a number, the number is

A. 16 B. 100 C. 320 D. 400

120209

120210 D.2

What percentage *is* 30 *of* 6?

A. 1.8% B. 5% C. 20% D. 500%

120210

120301 In a class of x students, 40% have fair hair. The number of students who do NOT have fair hair is

A. $\frac{2x}{5}$ B. $60x$ C. $\frac{x}{60}$ D. $\frac{3x}{5}$

120301

D.1

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

120401 An article costing \$10 is sold at a gain of 5% on the cost price. The selling price is

A. \$9.50 B. \$10.05 C. \$10.50 D. \$12.00

C.4 120401

120402 A man earns \$150. If he spends 30% of his wage on rent and 34% on household expenses, what percentage of his wage does he have left?

A. 36% B. 54% C. 64% D. 86%

A.5 120402

120403 An article costing \$2.00 is sold for \$2.50. The profit as a percentage of the cost price is

A. 20% B. 25% C. 50% D. 80%

B.4 120403

120404

SALE
10% DISCOUNT
ON ALL GOODS

What would you pay for a television set marked at \$150, in a shop displaying this sign?

A. \$15 B. \$135 C. \$140 D. \$148.50

B.4 120404

CUT OFF WHEN COPYING

120405 Calculate the simple interest earned when a sum of \$300 is invested for 5 years at an interest rate of 9% per annum.

A. \$27 B. \$45 C. \$90 D. \$135

D.4 120405

FOLD UNDER, COVER UP, OR CUT

120406 A salesman was told that he would receive a bonus of 5% of the profit from any sale he made. If he sells a TV for \$400, and the profit margin is 30% of the selling price, then he should receive a bonus of

A. \$1.50 B. \$6 C. \$20 D. \$35

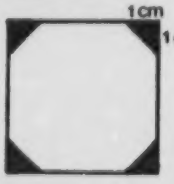
B.3 120406

120407 A man was originally earning \$300 per week. His salary was then reduced by 50%. The next month his salary was increased by 50%. His new salary is

A. \$300 B. \$450 C. \$150 D. \$225

D.3 120407

120408



A square photo of side 5 cm is mounted using photo corners whose equal sides measure 1 cm as shown. The percentage of the photo covered by the corners is

A. 2% B. 8% C. 16% D. 40%

B.3 120408

120501 C.3

A certain variety of orange drink contains 30 per cent orange juice, by weight. To every 100 g of the drink may be added a further 50 g of water. The percentage, by weight, of orange juice in the diluted mixture is

A. 10% B. 15% C. 20% D. 25%

120501

120502 A.3

An article is purchased for $100. It is sold at 10% profit on the cost price. The new owner decides to sell it for 10% more than he paid for it. His selling price would then be

A. $121 B. $120 C. $111 D. $110

120502

120503 A.3

A car is advertised for sale as follows: "Price $4500. $1000 deposit, then $100 per month for 4 years". Which of the following shows the total amount a buyer would pay for the car?

A. $48 \times \$100 + \$1000$ C. $\$4500 + 48 \times \$100 + \$1000$

B. $\$4500 + 48 \times \$100 - \$1000$ D. $\$1000 + 48 \times \$100 - \$4500$

120503

120504 C.3

On Monday there were 14 boys and 17 girls present in a class. If 4 boys and 5 girls were absent that day, what percentage of the full class is boys?

A. 35% B. 40% C. 45% D. $51\frac{3}{7}\%$

120504

120505 B.3

A motor bike, cash price $650, is bought through hire purchase. The deposit is $300 and repayments are $17 a month over two years. Interest is charged by the hire purchase company on

A. $650 B. $350 C. $300 D. $17

120505

120506 C.2

In a particular class, 65% of the students play tennis, 20% play hockey and 25% play neither. The percentage of students who play both tennis and hockey is

A. 0% B. 5% C. 10% D. 45%

120506

120507 B.2

A man has $10 000 which he wishes to invest for additional income. However, this additional income must not exceed $15 per week or he will lose his pension. If he invests all of the $10 000, which of the following interest rates will give the best return, and not cause loss of pension?

A. 5% per annum C. 10% per annum

B. 7% per annum D. 12% per annum.

120507

120601

Discount Plan I allows 20% discount immediately followed by a further 10% discount for cash.
Discount Plan II allows 10% immediately followed by 20% for cash.

A. Plan I is the cheaper.

B. Plan II is the cheaper.

C. Both Plans result in the same final price.

D. Either Plan could be cheaper depending on the price of the article.

C.2 120601

120602

A man starts a business with an investment of $20 000. If his investment increases by 50% every three years, at the end of 6 years his investment will have grown to

A. $40 000 B. $45 000 C. $60 000 D. more than $60 000

B.2 120602

120603

A lady bought an old chair for $10, spent $10 repairing it, then sold it for $40. What was her profit as a percentage of the selling price?

A. 20% B. 50% C. 100% D. 200%

B.2 120603

120604

An article is bought for $100 and then sold at 10% above this price. The new owner decides to sell at 10% less than what he paid for it. His selling price would be

A. $99 B. $100 C. $101 D. $110

A.2 120604

120605

After a pay rise, a man received $165 per week. If this is 110% of his former wage, then his former wage was

A. $148.50 B. $150.00 C. $17[illegible]50 D. none of these.

B.2 120605

120606

After 5% of a bill has been paid, $57 remains. How much was the bill?

A. $60.00 B. $68.40 C. $59.85 D. $111.15

A.2 120606

120607

If the radius of a circle is increased by 50% then its area is increased by

A. 50% B. 100% C. 125% D. 150%

C.1 120607

120608

A student has an average of 80% for 3 tests. What must he score on the next test to increase his average to 84%?

A. 84% B. 88% C. 92% D. 96%

D.1 120608

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

120701 A man bought some bread at 40¢ per loaf. He sold $\frac{3}{4}$ of the bread at 60¢ per loaf, but the rest went stale so he sold it at 20¢ per loaf. His total profit calculated on the selling price was

A. 0% B. 20% C. 25% D. $33\frac{1}{3}\%$

B.1 120701

120702 When water freezes, it expands by about 10%. Therefore, when ice melts it contracts by about

A. 9% B. 10% C. 11% D. 20%

A.1 120702

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

13 Ratio, Rates

130101

In a class of 40 there are 17 girls and the rest are boys. The ratio of boys to girls is

A. 17 : 23 B. 23 : 17 C. 23 : 40 D. 40 : 17

B.4

130101

130102

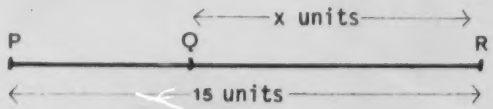
A firm employs 47 people. If 21 are women, the ratio of men to women is

A. 21 : 26 B. 21 : 47 C. 26 : 47 D. 26 : 21

D.4

130102

130103



PQ : QR =

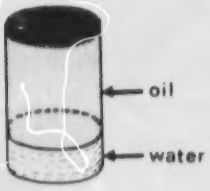
A. 15 : x B. 15 - x : x C. 15 : 15 - x D. 15 - x : 15

B.2

130103

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130201



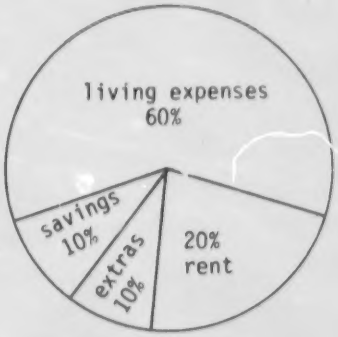
A drum contains oil and water in the ratio 6 : 1. When half of the oil is burnt what fraction of the remaining liquid is water?

A. $\frac{1}{4}$ B. $\frac{1}{3}$ C. $\frac{2}{5}$ D. $\frac{3}{4}$

A.1 130201

130202

A man's wages are spent as shown in the graph. What is the ratio of his rent to his living expenses?



A. 6 : 1 B. 3 : 1 C. 1 : 3 D. 1 : 6

C.4 130202

130203 Three men divide a sum of money up as follows: the first man takes half, the second takes one third of the remainder and the third man gets the rest. The ratio of their shares is

A. 2 : 1 : 1 B. 2 : 1 : 2 C. 3 : 1 : 2 D. 3 : 2 : 1

C.2 130203

130204 For a particular site a town planner decided that the areas set aside for buildings, garden development and roads would be in proportion 7 : 3 : 5. The fraction of the whole site allocated for garden development was

A. $\frac{1}{3}$ B. $\frac{1}{5}$ C. $\frac{3}{5}$ D. $\frac{3}{7}$

B.3 130204

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130301 The ratio $\frac{1}{2}$: 3 is equivalent to

A. 2 : $\frac{1}{3}$ B. 3 : 2 C. 6 : 1 D. 1 : 6

D.5 130301

130302 $1\frac{1}{2}$: $2\frac{1}{2}$ =

A. 3 : 5 B. 5 : 3 C. 1 : 2 D. 2 : 1

A.5 130302

130303 In which of the following is the pair of ratios equivalent?

A. 2 : 5, 10 : 13 C. 7 : 2, 63 : 14

B. 6 : 5, 18 : 15 D. 2 : 5, 5 : 2

B.4 130303

130304 $\frac{7}{9}$: 1 is the same as

A. 7 : 1 B. 9 : 1 C. 7 : 9 D. 9 : 7

C.1 130304

130305 If a - 2b = b - 2a then a : b =

A. 2 : 1 B. 3 : 1 C. 1 : 1 D. 1 : 2

C.3 130305

130306 If p:q = 1:2 and q:r = 3:4, then p:q:r =

A. 1 : 2 : 3 B. 1 : 2 : 4 C. 2 : 3 : 4 D. 3 : 6 : 8

D.2 130306

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130401 If \$24 is divided in the ratio 3 : 5, the smaller amount is

A. \$3 B. \$8 C. \$9 D. \$12

C.4 130401

130402 If \$60 is divided in the ratio 7 : 5, the larger amount is

A. \$7 B. \$12 C. \$25 D. \$35

D.4 130402

130403 \$60 is divided between Alan and Sandra in the ratio 2 : 3. What is Alan's share?

A. \$24 B. \$30 C. \$36 D. \$40

A.5 130403

130404 If \$30 is divided in the ratio 7 : 2, the smaller amount is

A. \$10 B. \$12 C. \$18 D. \$20

B.4 130404

130405 A photograph is 5 cm long and 4 cm wide. It is enlarged so that its width is 6 cm. What is the length of the enlargement?

A. 4.8 cm B. 7 cm C. 7.5 cm D. 8 cm

C.3 130405

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130406 Tom, Dick and Harry start a business, and invest \$4000, \$3000 and \$2000 respectively. The profits will be divided in proportion to the amounts invested. In a year when the profit is \$810, Tom, Dick and Harry will receive (in order)

A. \$270, \$270, \$270 C. \$350, \$270, \$190

B. \$370, \$270, \$170 D. \$360, \$270, \$180

D.3 130406

130407 John is twice as old as Bill now, but in three years time the ratio of their ages will be 7 : 4. An equation which expresses this information is

A. $\frac{2x+3}{x+3}=\frac{7}{4}$ B. $\frac{2x-3}{x-3}=\frac{7}{4}$ C. $\frac{x+3}{2x+3}=\frac{7}{4}$ D. $\frac{2x}{x}+3=\frac{7}{4}$

A.2 130407

130408 A map has a scale of 1 : 10 000. Which one of the following land distances would be equivalent to a map distance of 3.5 cm?

A. 35 km B. 350 m C. 35 m D. 3.5 m

B.2 130408

130409 A man leaves his \$6000 estate to be divided *equally* between his three sons, Bill, John and Eric. His wife leaves her \$6000 estate to be divided between Bill, John and Eric *in the ratio 1 : 2 : 3*. Which fraction compares Bill's total share to Eric's?

A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{2}{3}$ D. $\frac{3}{5}$

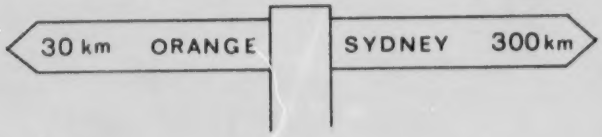
D.2 130409

130501 In a container there are 6 red counters, some green counters and some white counters.
The ratio of the number of red counters to the number of white counters is 1 : 2, and the ratio of the number of green counters to the number of white counters is 2 : 3. The number of green counters in the container is therefore

A. 2 B. 4 C. 8 D. 18

C.2 130501

130502 Driving from Orange to Sydney, I came to a sign:

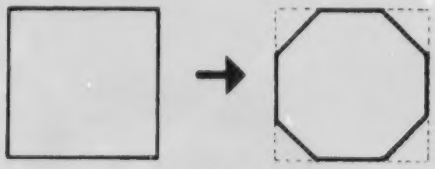


How much further do I have to drive, so that instead of being 10 times as far from Sydney as from Orange, I am only 9 times as far?

A. 3 km B. 9 km C. $2\frac{1}{2}$ km D. 30 km

A.1 130502

130503 A square is to be changed into a regular octagon by removing the four corners as shown.



The position of the corners of the octagon is found by dividing each side of the square in the ratio

A. 1 : 1 : 1 B. $1 : \sqrt{2} : 1$ C. 1 : 2 : 1 D. $\sqrt{2} : 4 : \sqrt{2}$

B.1 130503

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130601 A car travels 150 km in 3 hours. Its speed in km/h is

A. 5 B. 30 C. 50 D. 450

C.5 130601

130602 If a car travels 120 km between 10 am and 2 pm its average speed in km/h is

A. 20 B. 30 C. 40 D. 60

B.4 130602

130603 If a car covers 150 kilometres in 1½ hours, its speed in km/h is

A. 50 B. 75 C. 100 D. 225

C.4 130603

130604 A cyclist rides 24 km in 1½ hours. His speed in km/h is

A. 16 B. 18 C. 30 D. 36

A.4 130604

130605 A boy can save $18 in 8 weeks. At this rate how many weeks will it take him to save $81?

A. 36 B. 40 C. 71 D. 182¼

A.4 130605

130606 Which potatoes are the cheapest per kilogram?

A. 1 kg for 45 cents. C. 5 kg for $2.50.

B. 2.5 kg for $1.00. D. 10 kg for $4.25.

B.3 130606

130607 If 6 men take 6 days to dig a hole, how long will it take one man to dig the same hole?

A. 1 day B. 6 days C. 12 days D. 36 days

D.3 130607

130608 A car travels 24 km between 1.30 pm and 2.15 pm. What is its average speed in km/h ?

A. 18 B. 19.2 C. 32 D. 96

C.2 130608

130609 A car travels 50 metres in T seconds at a speed of V metres per second. Which of the following is the correct relationship between T and V?

A. $V = \frac{50}{T}$ B. $V = 50T$ C. $V \propto 50T$ D. $V = \frac{T}{50}$

A.2 130609

130701 During a vacation a boy is offered a job in which the rate of pay is \$1 on the first day then on each day after the first he receives twice the preceding day's pay. How many days will be have to work in order to have enough to buy a surfboard for \$30?

A. 4 B. 5 C. 6 D. 15

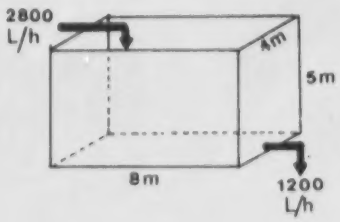
B.2 130701

130702 A speed of 36 kilometres per hour is equivalent to how many metres per second?

A. 10 B. $\frac{36^2}{10}$ C. $\frac{216}{100}$ D. 600

A.2 130702

130703



Water is entering this 8 m × 4 m × 5 m storage tank at the rate of 2800 litres per hour, while at the same time water is flowing out at the rate of 1200 litres per hour.

(1 cubic metre = 1000 litres)

The water level in the tank is

A. rising at the rate of 5 cm per hour.

B. rising at the rate of 50 cm per hour.

C. falling at the rate of 5 cm per hour.

D. falling at the rate of 50 cm per hour.

A.2 130703

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

130704 The mixture of petrol and oil for my lawn mower is in the ratio 40 : 1. If I use 10 litres of petrol, how much oil do I need to use?

A. 25 millilitres. C. 500 millilitres.

B. 250 millilitres. D. 1 litre.

B.2 130704

130705 The cold tap can fill a bath twice as quickly as the hot tap. The cold tap alone takes 6 minutes. Both taps together would take

A. 3 minutes. B. 4 minutes. C. 9 minutes. D. 12 minutes.

B.1 130705

130706 It took a car three hours to travel 100 km from A to B. The car averaged 60 km/h on the open road and 30 km/h in built-up areas. If x is the distance travelled on the open road which of the following equations could be used to find x?

A. $3 = \frac{x}{60} + \frac{100 - x}{30}$ C. $100 = 60x + 30(100 - x)$

B. $3 = \frac{x}{60} + \frac{x - 100}{30}$ D. $100 = 60x + 30(x - 100)$

A.1 130706

130801 A particular car has a top speed of 180 km/h. How far will it travel in 1 second at top speed?

A. 5 m B. 50 m C. 300 m D. 3 km

B.1 130801

130802 If one man could paint a house in 10 days and another man would take 6 days to paint the same house, how long will it take to paint the house if they both work together?

A. $3\frac{3}{4}$ days B. 4 days C. 8 days D. 16 days

A.1 130802

130803 An exact scale model 30 cm long is made of a steam engine which is actually 30 m long. If x litres of paint are required to paint the real engine, then the number of litres required to paint the model is

A. $\frac{x}{1\ 000\ 000}$ B. $\frac{x}{10\ 000}$ C. $\frac{x}{300}$ D. $\frac{x}{100}$

B.1 130803

130804 A business consultant's fees are \$45 for an 8-hour day. He uses the formula $E = \frac{45x}{8}$ to calculate his earnings, E, (in dollars). What does x represent?

A. The earnings per day. C. The earnings per hour.

B. The number of days worked. D. The number of hours worked.

D.1 130804

130805 If an Australian dollar is worth 1.25 American dollars, then an American dollar is worth

A. 0.75 Australian dollars. C. 1.50 Australian dollars.

B. 0.8 Australian dollars. D. 1.56 (approx.) Australian dollars.

B.1 130805

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14

Surds, Indices, Logarithms

140101 Use tables (if necessary) to find which of the following is the best approximation for $\sqrt{31}$.

A. 3.1 B. 3.14 C. 5.5 D. 5.57

D.5 140101

140102 Which of the following is an irrational number?

A. $\sqrt{3}$ B. $\sqrt{16}$ C. $\sqrt{49}$ D. $\sqrt{\frac{1}{4}}$

A.4 140102

140103 $\sqrt{8^2 + 6^2} =$

A. 10 B. 14 C. 100 D. 14

A.4 140103

140104 $\frac{\sqrt{16} + \sqrt{9}}{\sqrt{16 + 9}} =$

A. 1 B. 0 C. $\frac{7}{5}$ D. 2

C.4 140104

140105 Which of the following is the largest?

A. $\sqrt{\frac{4}{9}}$ B. $\sqrt{\frac{9}{25}}$ C. $\sqrt{\frac{9}{16}}$ D. $\sqrt{\frac{16}{25}}$

D.3 140105

140106 Between which two natural numbers does $\sqrt{7}$ lie?

A. 7 and 8 B. 6 and 7 C. 3 and 4 D. 2 and 3

D.3 140106

140107 Which of the following expressions is rational?

I. $\sqrt{4} + \sqrt{5}$
II. $\sqrt{4} + \sqrt{9}$

A. I only. C. Both I and II.
B. II only. D. Neither I nor II.

B.2 140107

140108 Which is the best approximation for $\frac{5\sqrt{3} \times 7\sqrt{5}}{9\sqrt{7}}$?

A. 60 B. 6.0 C. 0.6 D. 0.06

B.1 140108

140201 $\sqrt{75}$ =

A. $5\sqrt{3}$ B. $3\sqrt{5}$ C. $5\sqrt{15}$ D. 37.5

A.3 140201

140202 $\sqrt{3^3}$ simplifies to

A. $\sqrt{6}$ B. 3 C. $3\sqrt{3}$ D. $13\frac{1}{2}$

C.3 140202

140203 $\sqrt{1\frac{9}{16}}$ =

A. $\frac{25}{32}$ B. $1\frac{1}{4}$ C. $1\frac{3}{4}$ D. $3\frac{1}{8}$

B.2 140203

140204 $\sqrt[3]{-27}$ =

A. -3 B. $-\frac{1}{3}$ C. $\frac{1}{3}$ D. 3

A.2 140204

140205 $\sqrt{3} + \sqrt{3}$ =

A. 3 B. 6 C. $\sqrt{6}$ D. $2\sqrt{3}$

D.2 140205

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140206 Which of the following is true?

I. $\sqrt{3} + \sqrt{5} = \sqrt{8}$
II. $\sqrt{3} + \sqrt{3} = \sqrt{12}$
III. $\sqrt{3} + 3\sqrt{3} = \sqrt{48}$

A. I only. C. All are correct.

B. II and III only. D. All are incorrect.

B.1 140206

140207 $\sqrt{8} + \sqrt{32}$ =

A. $5\sqrt{8}$ B. $\sqrt{40}$ C. $6\sqrt{2}$ D. None of these.

C.1 140207

140208 $\frac{3 + \sqrt{18}}{3}$ simplifies to

A. $1 + \sqrt{2}$ B. $1 + \sqrt{6}$ C. $1 + \sqrt{18}$ D. $\sqrt{18}$

A.1 140208

140209 $(3\sqrt{2} - 2\sqrt{3})^2$ =

A. 6 B. 30 C. $6 - 12\sqrt{6}$ D. $30 - 12\sqrt{6}$

D.1 140209

140301 Which of the following is equal to $\frac{3\sqrt{75}}{\sqrt{3}}$?

A. $5\sqrt{3}$ B. 15 C. $15\sqrt{3}$ D. None of these.

B.1 140301

140302 $\frac{1}{3+\sqrt{2}}$ is equivalent to

A. $3-\sqrt{2}$ B. $\frac{1}{3}+\frac{1}{\sqrt{2}}$ C. $\frac{3+\sqrt{2}}{7}$ D. $\frac{3-\sqrt{2}}{7}$

D.1 140302

140303 $\frac{1}{3-\sqrt{2}}$ is equal to

A. $\frac{3-\sqrt{2}}{11}$ B. $\frac{3-\sqrt{2}}{7}$ C. $\frac{3+\sqrt{2}}{11}$ D. $\frac{3+\sqrt{2}}{7}$

D.1 140303

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140401 $4 + 4^2 =$

A. 12 B. 20 C. 32 D. 64

B.5 140401

140402 $7^2 + 1^2 =$

A. 16 B. 50 C. 51 D. 64

B.5 140402

140403 $2^3 + 3^2 =$

A. 12 B. 14 C. 15 D. 17

D.5 140403

140404 Which of the following is equal to 12?

A. 2^6 B. $2^3 + 2^1$ C. $2^3 + 2^2$ D. $2^3 + 2^2 + 2^1$

C.5 140404

140405 $10^2 : 5^3$ simplifies to

A. 4 : 5 B. 2 : 3 C. 2 : 1 D. 4 : 3

A.5 140405

140406 If $2^8 = 256$, then $2^9 =$

A. $256 + 2$ B. 256×2 C. $\frac{256 \times 9}{8}$ D. 256×256

B.5 140406

140407 $3^3 \times 3^4 =$

A. 9^{12} B. 9^7 C. 3^{12} D. 3^7

D.3 140407

140408 $3^8 : 3^2 =$

A. 1^4 B. 3^4 C. 1^6 D. 3^6

D.3 140408

140409 Which of the following represents the largest number?

A. 222 B. 22^2 C. $[(2^2)^2]^2$ D. 2^{22}

D.3 140409

140410 $(-1)^{73} =$

A. -1 B. 1 C. -73 D. 73

A.2 140410

FOLD UNDER & COVER UP. OR CUT OFF WHEN COPYING

140501 Which of the following equations are true?

I. $3^2 + 2^2 = 5^2$
II. $(3 + 2)^2 = 5^2$
III. $5^2 + 0^2 = 5^2$
IV. $7^2 - 2^2 = 5^2$

A. I and IV only.
B. II only.
C. II and III only.
D. I, II, III and IV.

C.2 140501

140502 Which of the following is equal to $2^3 \times 5^3$?

A. 10^3 B. 10^6 C. 10^9 D. None of these

A.1 140502

140503 Which of the following is equivalent to $2^7 \times 4^3$?

A. 2^{13} B. 2^{12} C. 8^{21} D. 8^{10}

A.1 140503

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140601 C.3

Which one of the following expressions is equal to e^{18}?

A. $(e^3)^3 \times e^2$ B. $e^6 \times e^3$ C. $(e^4)^4 \times e^2$ D. $(e \times e^2 \times e^3 \times e^4)^2$

140601

140602 B.3

$a^9 \div (a^3)^2 =$

A. 1 B. a^3 C. a^4 D. a^{12}

140602

140603 B.2

$(3a^2)^3 =$

A. $27a^5$ B. $27a^6$ C. $9a^5$ D. $9a^6$

140603

140604 C.2

$(2a^2)^3 =$

A. $6a^5$ B. $6a^6$ C. $8a^6$ D. $8a^8$

140604

140605 A.2

$2(ax^3)^2$ simplifies to

A. $2a^2x^6$ B. $4a^2x^6$ C. $2a^3x^5$ D. $4a^3x^5$

140605

140606 C.2

$\frac{k^6 \times k^8}{k^2}$ simplifies to

A. k^7 B. k^{11} C. k^{12} D. k^{20}

140606

140607 C.2

Which of the following is NOT equal to $\sqrt{16^{2x}}$?

A. 2^{4x} B. 4^{2x} C. 8^{2x} D. 16^x

140607

140608 D.1

If $3^x = p$ then $27^x =$

A. 27p B. 9p C. 3p D. p^3

140608

140609 D.1

If $25^x = 125$ then $x =$

A. 5 B. $\frac{2}{3}$ C. 2 D. $\frac{3}{2}$

140609

140610 A.2

The equation $ax = x^n$ is true when

A. $x = 0$ and $a = 1$
B. $x = 1$ and $a = 0$
C. $x = 1$ and $a = 2$
D. $x = -2$ and $a = 2$

140610

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140701 Which of the following is NOT a correct index statement?

A. $a^n \times b^n = (ab)^n$

B. $a^m \times a^n = a^{m+n}$

C. $(a^m)^n = a^{mn}$

D. $a^m \times b^n = (ab)^{m+n}$

D.1 140701

140702 What is half of 2^{2n}?

A. 2^n B. 2^{2n-1} C. 1^{2n} D. 1^n

B.1 140702

140703 $2^{n+1} + 2^{n+1} =$

A. 2^{n+2} B. 2^{2n+2} C. 4^{2n+2} D. 4^{n+1}

A.1 140703

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140801 $\frac{16}{81}$ may also be written

A. $\frac{4}{9}$ B. $(\frac{2}{3})^3$ D. $(\frac{4}{9})^2$ D. $(\frac{2}{3})^{-4}$

C.4 140801

140802 Which of the following statements is false?

A. $2^4 = 4^2$ B. $3^2 = \sqrt{81}$ C. $3^0 = 1^3$ D. $5^2 = \sqrt{100}$

D.3 140802

140803 $16^{\frac{1}{2}} =$

A. $\frac{1}{256}$ B. $\frac{1}{4}$ C. 4 D 8

C.3 140803

140804 Simplify 2^{-2}

A. -4 B. $\frac{1}{4}$ C. $\frac{1}{2}$ D. $\frac{1}{8}$

B.3 140804

140805 $(-2)^{-4} =$

A $\frac{1}{16}$ B. -8 C. -16 D. $\frac{1}{8}$

A.3 140805

140806 If $a = -3$, then $a^{-1} =$

A. $\frac{1}{3}$ B. $-\frac{1}{3}$ C. 3 D. -3

B.2 140806

140807 If $a = -2$ and $b = 2$, then $b^a =$

A. -4 B. $-\frac{1}{4}$ C. $\frac{1}{4}$ D. 4

C.3 140807

140808 $3m^0 =$

A. 0 B. 1 C. $\frac{1}{3}$ D. 3

D.2 140808

140809 $(16^{\frac{1}{2}})^{-2} =$

A. -64 B. 64 C. $\frac{1}{16}$ D. -16

C.2 140809

140810 The simplest equivalent to $5y^0$ is

A. 0 B. 1 C. 5 D. 5y

C.2 140810

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140901 Which statement below is NOT true?

A. $8^{\frac{1}{3}} = 2$ B. $8^{\frac{1}{2}} = 4$ C. $8^{\frac{2}{3}} = 2^2$ D. $8^{\frac{1}{3}} = \sqrt[3]{8}$

B.1 140901

140902 Which statement is correct?

I. $e^{4\frac{1}{2}} = e^3 + e^{1\frac{1}{2}}$

II. $e^{4\frac{1}{2}} = e^9 \div e^2$

A. I only. C. Both I and II.

B. II only. D. Neither I nor II.

D.2 140902

140903 If p is an integer greater than 1, p^{-2} is

A. a negative integer. C. a negative fraction greater than -1.

B. a positive integer. D. a positive fraction less than 1.

D.2 140903

140904 Given that $\sqrt[5]{5}$ means $5^{\frac{1}{5}}$, then $(\sqrt[5]{5})^5 =$

A. $\sqrt[25]{5}$ B. $\sqrt[5]{25}$ C. $5^{\frac{1}{25}}$ D. 5

D.1 140904

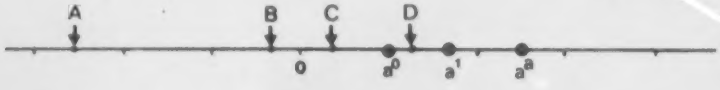
FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

140905 Another expression for $(-2)^{2n}$ is

A. $-(2^{2n})$ B. 4^n C. -4^n D. 2^{n^2}

B.1 140905

140906 The number line below is drawn to scale, but the scale is not shown. The position of zero is marked and the numbers a^0, a^1, and a^a are plotted. Which of the four points A, B, C, D represents a^{-a}?



C.1 140906

141001

If $230,000 = 2.3 \times 10^{n}$, then n =

A. -5 B. -4 C. 4 D. 5

D.3

141001

141002

$2.3 \times 10^{7} \times 1.1 \times 10^{-3} =$

A. 2.53×10^{4} B. 2.53×10^{-21} C. 3.4×10^{4} D. 3.4×10^{-21}

A.2

141002

141003

The square root of 8.1×10^{3} can be expressed as

A. 9.0×10^{2} B. 2.85×10^{3} C. 9.0×10 D. 2.85×10^{2}

C.2

141003

141004

A geologist estimates rock X to be 10^{8} years old and rock Y to be 10^{5} years old. Rock X is

A. 30 years older than rock Y.

B. 30 times the age of rock Y.

C. 1 000 years older than rock Y.

D. 1 000 times the age of rock Y.

D.2

141004

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141101 Which number could have 2.5349 as its logarithm?

A. 342.7 B. 34.27 C. 3.427 D. 0.3427

A.4 141101

141102 The logarithm of a certain number is 3.7539. Which one is it?

A. 5.674 B. 56.74 C. 567.4 D. 5674

D.4 141102

141103 If $\log x = 0.7820$, then x equals

A. log 0.7820 B. 0.7820^{10} C. 10(log 0.7820) D. $10^{0.7820}$

D.4 141103

141104 Which of the following could be the logarithm (base 10) of 2.5349?

A. 0.3427 B. 0.4040 C. 342.7 D. 404.0

D.3 141104

141105 Log 241 lies between

A. 0 and 1 B. 1 and 2 C. 2 and 3 D. 3 and 4

C.3 141105

141106 The characteristic of log 16.02 is

A. 1 B. 2 C. -1 D. 0

A.3 141106

141107 The characteristic of log 0.00243 is

A. -3 B. -2 C. 2 D. 3

A.3 141107

141108 Log 0.003427 could equal

A. 0.5349 B. $\bar{2}.3427$ C. 3.427 D. $\bar{3}.5349$

D.2 141108

141109 If $\log k = 0.7415$, which of the following statements is correct?

A. $10^k = 0.7415$ C. $k = 10^{0.7415}$

B. $k = 7.415$ D. $\log k^2 = 2.7415$

C.3 141109

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

141201 The result of the logarithm subtraction

$\begin{array}{r} \bar{1}.5736 \\ \underline{\bar{3}.8736} \\ \hline \end{array}$ - is

A. $\bar{3}.7000$ B. $\bar{1}.7000$ C. 1.7000 D. 3.7000

C.1 141201

141202 If N lies between 0 and 1 then $\log_{10} N$ is

A. greater than 1. C. less than zero.

B. between zero and 1. D. undefined.

C.1 141202

141203

No.	Log
4.5	0.6532
2	0.3010
÷	0.9542

The above working could be used in calculating

A. 4.5×2 B. $(4.5)^2$ C. $4.5 \div 2$ D. $\sqrt{4.5}$

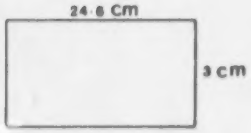
A.4 141203

141204 For which problem below could this be part of the logarithm working?

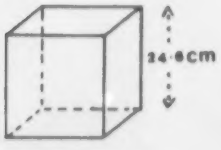
Number	Logarithm
24.6	1.3909 ×
	3
.... ÷	4.1727

A.

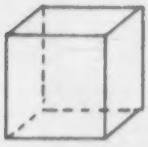
What is the perimeter of this triangle?

B. 

What is the area of this rectangle?

C. 

The sides of a cube are 24.6 cm long. What is its volume?

D. 

If the cube has a volume of 24.6 cubic units, what is the length of each side?

77

C.1 141204

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141301 When using logarithms to calculate $\sqrt{\frac{45.6}{12.8}}$ it is correct to

A. add logs, then multiply the result by 2.

B. add logs, then divide the result by 2.

C. subtract logs, then multiply the result by 2.

D. subtract logs, then divide the result by 2.

D.3 141301

141302 If you were asked to evaluate $\frac{\sqrt{6.56}}{3.9}$ using logarithm tables, select from the following four methods the method that would give the correct answer.
DO NOT CALCULATE THE ANSWER.

A. Determine the logarithm of 6.56.
Subtract the logarithm of 3.9.
Halve the answer to this subtraction.
Use antilogarithm tables and obtain the answer.

B. Determine the logarithm of 6.56.
Halve this logarithm.
Add to this the logarithm of 3.9.
Use antilogarithm tables and obtain the answer.

C. Determine the logarithm of 6.56.
Halve this logarithm.
Subtract from this the logarithm of 3.9.
Use antilogarithm tables and obtain the answer.

D. Determine the logarithm of 6.56.
Add to this the logarithm of 3.9.
Halve the answer to this addition.
Use antilogarithm tables and obtain the answer.

C.3 141302

FOLD WHERE, COVER UP, OR CUT OFF WHEN COPYING

141303 Which of the expressions below could be evaluated using the following steps?

Step I. Take logarithms of each number.
Step II. Add the logarithms together.
Step III. Divide the result in step II by 2.
Step IV. Take antilogarithm of the answer to step III.

A. $\frac{37.26 \times 2.043}{2}$

B. $\sqrt{37.26 \times 2.043}$

C. $\sqrt{37.26 + 2.043}$

D. $\sqrt{\frac{37.26}{2.043}}$

B.2 141303

141401 C.2

If $\log_{10}2 = 0.3010$ then $\log_{10}0.2 =$

A. 0.03010 B. 1.3010 C. $\overline{1}.3010$ D. $\overline{2}.3010$

141401

141402 C.1

If $\log_{10}x = 2$, then $x =$

A. 0.3010 B. 20 C. 100 D. 2

141402

141403 D.2

The product xy is to be found using logarithms. If log x has a positive characteristic and log y has a negative characteristic, then log xy

A. will have a positive characteristic.

B. will have a negative cha-acteristic.

C. will have a zero characteristic.

D. could have any of the above.

141403

141404 A.2

If log x = 1.3010, and log y = 2.4771 then

A. $\log \frac{y}{x} = 2.4771 - 1.3010$

B. $\log \frac{y}{x} = 2.4771 \div 1.3010$

C. $\log (y - x) = 2.4771 - 1.3010$

D. $\log (y - x) = 2.4771 \div 1.3010$

141404

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

141405 A.2

If $\log x = \overline{2}.6884$, then $x =$

A. $10^{-2} \times 10^{.6884}$

B. $10^{-2} \div 10^{.6884}$

C. $10^{1.6884} \div 10^{2}$

D. $10^{-3} \times 10^{-.6884}$

141405

141406 B.1

If $\log_{10}y = 0.6235$ then $\log_{10}10y =$

A. $\overline{1}.6235$ B. 1.6235 C. 6.2350 D. 10.6235

141406

141407 B.1

If $\log_{10}a = 1.2345$ then $\log_{10}100a =$

A. 2.4690 B. 3.2345 C. 123.45 D. 101.2345

141407

141408 B.1

If log 20 = 1.301, which of the following statements is true?

I. Log 2 = 0.1301
II. Log 200 = 2.301

A. I only.

B. II only.

C. Both I and II.

D. Neither I nor II.

141408

141501 $x = 10^y$ is equivalent to

A. $\log_{10} x = y$ B. $\log_x 10 = y$ C. $\log_{10} y = x$ D. $\log_y 10 = x$

A.1 141501

141502 Given only that $\log_{10} 2 = 0.3010$ and $\log_{10} 3 = 0.4771$, which of the following could NOT be calculated using these values?

A. $\log_{10} 5$ B. $\log_{10} 12$ C. $\log_{10} 20$ D. $\log_{10} 30$

A.1 141502

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

141601

If x and y are positive numbers and $y = x^5$, then

A. $\log_y 5 = x$ B. $\log_5 y = x$ C. $\log_y x = 5$ D. $\log_x y = 5$

D.1

141601

141602

$\text{Log}_4 16 =$

A. 2 B. 4 C. 8 D. 12

A.2

141602

141603

If $3^x = 81$, then

A. the logarithm of 3 using base 81 is x.

B. the logarithm of 81 using base 3 is x.

C. the logarithm of x using base 3 is 81.

D. the logarithm of 81 using base x is 3.

B.1

141603

141604

If $\log x = 0.9000$, then $\log x^2 =$

A. 0.3000 B. 0.4500 C. 0.8100 D. 1.8000

D.1

141604

141605

$\text{Log } \sqrt{1.69} =$

A. $\frac{1}{2} \log 1.69$ B. $\sqrt{\log 1.69}$ C. $2 \log 1.69$ D. $\log 0.13$

A.1

141605

141606

Which one of the following has the same value as $\log 2^3$?

A. $2 \log 3$ B. $3 \log 2$ C. $\log 2 + \log 3$ D. $(\log 2)(\log 3)$

B.1

141606

141607

$\log 25 + \log 4 =$

A. $\log 29$ B. 100 C. 2 D. $5 \log 2 + 2 \log$

C.1

141607

141608

The value of $\frac{\log 16}{\log 4}$ is

A. 2 B. 4 C. $\log 4$ D. $\log 12$

A.1

141608

141609

Given that $\log x = 0.3$ and $\log y = 0.2$, which of the following is true?

A. $\log xy = 0.6$ C. $\log \frac{x}{y} = 0.15$

B. $\log xy = 0.06$ D. $\log \frac{x}{y} = 0.1$

D.1

141609

141701 If $\log a = b$, then

A. $\log a^2 = 2b$

B. $\log 2a = 2b$

C. $\log \frac{a}{2} = \frac{b}{2}$

D. $\log \sqrt{a} = \sqrt{b}$

A.1 141701

141702 If $x \log_b 5 = \log_b 25$, then $x =$

A. $\frac{1}{5}$ B. 2 C. 5 D. $\log_b 20$

B.1 141702

141703 Given only the values of log 2, log 3 and log 10, which of the following could NOT be calculated using these values?

A. $\log \frac{2}{3}$ B. log 23 C. log 30 D. log 32

B.1 141703

141704 Given only the values of log M and log N which of the following cannot be found using these values?

A. $\log M + \log N$

B. $\log (M + N)$

C. $\log M^2N$

D. $\text{Log } \frac{M}{N}$

B.1 141704

141705 If $\log_{10} 10 = 1$ then $\log_{100} 100$ is equal to

A. 1 B. 2 C. 10 D. 10^2

A.1 141705

141706 If $N = 5^{4-x}$ and $\log_5 N = 1$, then $x =$

A. 4 B. 3 C. 1 D. 0

B.1 141706

141707 $\log (x + y)^n =$

A. $\log x^n + \log y^n$

B. $\log x + \log y^n$

C. $n \log (x + y)$

D. $n \log x + n \log y$

C.1 141707

141708 The value of x in the equation $\log_3 x = 4$ is

A. $4^{\frac{1}{3}}$ B. 12 C. 81 D. 64

C.1 141708

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

15 Basic Algebra

15.01

150101 $-5 + 6 - 2 =$

A. 1 B. -1 C. 9 D. -13

B.5 150101

150102 On a Monday night the lowest temperature was -6^0 and the following night the lowest temperature was -2^0. Therefore Tuesday night was

A. 4^0 colder than Monday night.

B. 8^0 colder than Monday night.

C. 4^0 warmer than Monday night.

D. 8^0 warmer than Monday night.

C.4 150102

150103 $(-6) - (-4) =$

A. -2 B. -10 C. 2 D. 10

A.3 150103

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

150201 $5y - 3 + 3y =$

A. $8y - 3$ B. $2y - 3$ C. $5y$ D. $5y - 6$

150201

A.5

150202 $5ab + 6ba + 7abc =$

A. $18abc$ B. $11ab + 7ab$ C. $18aaabbbc$ D. $ab + ba + abc + 18$

150202

B.3

150203 $3m \times 5n =$

A. $8mn$ B. $15mn$ C. m^3n^5 D. None of these.

150203

B.5

150204 $27a^3 \div 3a^2 =$

A. $24a$ B. $9a$ C. $9a^2$ D. $9a^3$

150204

B.4

150205 $18s^4 \div 9s =$

A. $9s^3$ B. $9s^4$ C. $2s^3$ D. $2s^4$

150205

C.4

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

150206 $\frac{2p^2}{4p} =$

A. 1 B. p C. $\frac{p}{2}$ D. $\frac{1}{2p}$

150206

C.?

150207 If $a = b$ then $\frac{2a + 3b}{5b}$ can be simplified to

A. $5b$ B. 5 C. 1 D. 0

150207

C.4

150208 If $s = \frac{3}{2}t$, then $2s =$

A. $\frac{1}{2}t$ B. $2t$ C. $4\frac{1}{2}t$ D. $9t$

150208

C.3

150209 Which sequence of operations will change the expression $\frac{3x - y + 2}{5}$ so that it will be equal to $3x$?

A. Multiply by 5, add 2, add y.

B. Divide by 5, subtract 2, add y.

C. Multiply by 5, add y, subtract 2.

D. Subtract 2, add y, multiply by 5.

150209

C.2

150301

If $\frac{1}{3x} = t$, then $\frac{1}{x^2} =$

A. $9t^2$ B. $3t^2$ C. $\frac{t^2}{3}$ D. $\frac{t^2}{9}$

A.1

150301

150302

If $ab = c$ and $\frac{1}{a^2} + \frac{1}{b^2} = d$ then $a^2 + b^2 =$

A. cd B. c^2d D. $\frac{1}{d}$ D. $d - c^2$

B.1

150302

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

150401 C.5

When $r = 3$, the value of $2r^2$ is

A. 6 B. 12 C. 18 D. 36

150401

150402 B.5

If $a = 6.6$ and $b = 3.4$, the value of $\frac{a+b}{2}$ is

A. $\sqrt{10}$ B. 5.0 C. 6.7 D. 8.3

150402

150403 B.4

When $x = 4$, the value of $5x^2$ is

A. 400 B. 80 C. 40 D. 20

150403

150404 D.5

If $x = 5$ and $y = 4$, then the value of $x^2 - y^2$ is

A. 1 B. 2 C. 3 D. 9

150404

150405 C.4

If $x = 3$ and $y = 2$, the value of $x^2 - xy$ is

A. 0 B. 1 C. 3 D. 4

150405

150406 A.4

If $x = -1$, what is the value of $3x + 4$?

A. 1 B. -1 C. 7 D. -7

150406

150407 B.5

If $x = -7$, then $3x + 3 =$

A. 13 B. -13 C. 29 D. -29

150407

150408 C.3

If $x = -3$ what is the value of $2x^2$?

A. -36 B. -18 C. 18 D. 36

150408

150409 B.3

If $x = -2$, $3x^2 =$

A. 36 B. 12 C. -12 D. -36

150409

150410 C.3

When $y = -2$, the value of y^3 is

A. -6 B. 6 C. -8 D. 8

150410

FOLD UNDER, COVER UP, OR CUT OFF WHEN COPYING

150501 If $x - 2y = 7$, then the value of y when $x = 3$ is

A. 5 B. 2 C. -2 D. -5

C.3 150501

150502 If $S = \{(x,y) : 2x + y = 7\}$,
for what value of m does (3,m) belong to S?

A. 1 B. 2 C. 4 D. 13

A.2 150502

150503 If x is replaced by 1 in the polynomial
$x^{100} + x^{98} + x^{96} + \ldots\ldots\ldots + x^4 + x^2 + 1$
the value of the polynomial will be

A. 50 B. 51 C. 100 D. 101

B.1 150503

150504 Which of the following ordered pairs gives the greatest value for the expression $y - 4x + 5$?

A. (0,0) B. (0,3) C. (1,5) D. (3,2)

B.1 150504

150505 When $x = 2$ and $y = -1$, the difference between $(x - y)^2$ and $x^2 - y^2$ is

A. 0 B. 2 C. 4 D. 6

D.1 150505

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150601 D.4

Simplify $2(3a + 4) + 3(a - 5)$.

A. $9a + 23$ B. $9a + 3$ C. $9a - 1$ D. $9a - 7$

150601

150602 B.4

The expression $-4(x - 1)$ is equivalent to

A. $-4x + 1$ B. $-4x + 4$ C. $-4x - 1$ D. $-4x - 4$

150602

150603 C.3

$4 - 3(2 - x) =$

A. $-2 - x$ B. $2 - 3x$ C. $-2 + 3x$ D. None of these.

150603

150604 A.3

$3(2x - 5) - 2(4 - x)$ simplifies to

A. $8x - 23$ B. $7x - 13$ C. $5x - 13$ D. $4x - 23$

150604

150605 B.2

$3(a - 2b) - a(2 - b)$ simplifies to

A. $a - 2b + ab$ B. $a - 6b + ab$ C. $3a - 6b + ab$ D. $a - 6b - ab$

150605

150606 D.1

For all values of n, $n(n + n^2) =$

A. $n(1 + n)$ B. n^4 C. n^5 D. $n^2 + n^3$

150606

150607 B.3

$(2x + 3)(x - 2) =$

A. $3x + 1$ B. $2x^2 - x - 6$ C. $2x^2 + 7x - 6$ D. $3x^2 + x - 6$

150607

150608 D.3

$(3x - 2)(x - 3) =$

A. $3x^2 + 6$ B. $3x^2 - 11x - 6$ C. $3x^2 + 11x + 6$ D. $3x^2 - 11x + 6$

150608

150609 A.3

$(2x + 3)(x - 2) =$

A. $2x^2 - x - 6$ B. $2x^2 - 7x - 6$ C. $2x^2 - 4x + 6$ D. $2x^2 + 3x + 6$

150609

150610 D.3

$(3a + 2b)(3a - 2b) =$

A. $9a^2 + 12ab - 4b^2$ C. $9a^2 + 4b^2$

B. $9a^2 - 12ab - 4b^2$ D. $9a^2 - 4b^2$

150610

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150701 Which of the following is equal to $(1 + x)(1 + y)$?

A. $1 + x + y$ B. $1 + xy$ C. $x + y + xy$ D. $1 + x + y + xy$

D.3 150701

150702 $(\sqrt{3} - y)(\sqrt{3} + y) =$

A. $3 - y^2$ B. $9 - y^2$ C. $9 + y^2$ D. $\sqrt{9 + y^2}$

A.2 150702

150703 $2(x + 3)^2 =$

A. $4x^2 + 36$ B. $4x^2 + 24x + 36$ C. $2x^2 + 12x + 18$ D. $2x^2 + 18$

C.1 150703

150704 Which of the following expressions is NOT equivalent to the other three?

A. $(x^2 - y^2)(x^2 + y^2)$ C. $(x - y)(x^3 + x^2y + xy^2 + y^3)$

B. $(x^2 - y^2)^2$ D. $x^4 - y^4$

B.1 150704

150705 Which of the following statements is true?

I. The double of $(x + y)$ equals the double of x plus the double of y.
II. The square of $(x + y)$ equals the square of x plus the square of y.

A. I only. C. Both I and II.

B. II only. D. Neither I nor II.

A.1 150705

150706 Which of the following statements is true?

I. Half of $(x + y)$ equals half of x plus half of y.
II. Half of (xy) equals half of x multiplied by half of y.

A. I only. C. Both I and II.

B. II only. D. Neither I nor II.

A.1 150706

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150801

$4a^2 + 12ab^2 =$

A. $4a(1 + 3b^2)$ B. $4ab(a + 3b)$ C. $4a(a + 12b^2)$ D. $4a(a + 3b^2)$

150801

D.4

150802

Factorise $3x^2 - 9x$.

A. $3x(x - 3)$ B. $3x(x - 9)$ C. $(3x + 1)(x - 9)$ D. $3(x + 3)(x - 3)$

150802

A.4

150803

For all values of x, $2x^3 - x^2 =$

A. $2x^2(x - 1)$ B. $x^2(2x - 1)$ C. $2(x^3 - x^2)$ D. $2 + x$

150803

B.2

150804

Which of the following does NOT have $x + y$ as a factor?

A. $x^2 + xy$ B. $y^2 + xy$ C. $x^2 + y^2$ D. $x^2 - y^2$

150804

C.1

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15.09

150901 If one book costs \$x, what is the cost of 6 books?

A. $\$\frac{x}{6}$ B. \$6x C. \$(x + 6) D. $\$\frac{6}{x}$

B.5 150901

150902 If 6 bags of wheat cost \$x what is the cost of 1 bag?

A. \$6x B. $\$\frac{6}{x}$ C. $\$\frac{x}{6}$ D. \$(x - 6)

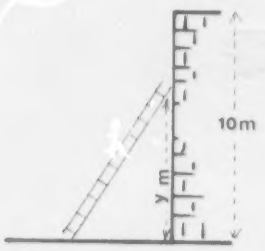
C.5 150902

150903 I have 4 chocolates and eat x of them. The number left is

A. $\frac{x}{4}$ B. $\frac{4}{x}$ C. x - 4 D. 4 - x

D.5 150903

150904 A ladder reaches y metres up a 10 metre high wall as shown. How far short of the top of the wall does it reach?



A. (10 - y) metres
B. (10 + y) metres
C. (y - 10) metres
D. y metres

A.5 150904

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150905 *When twice a number n is increased by a number f, the result is 30.* This can be written

A. $2nf = 30$ B. $2(n + f) = 30$ C. $n + 2f = 30$ D. $2n + f = 30$

D.5 150905

150906 A woman pays an account for x cents using a \$5 note. The change, in cents, is equal to

A. 500 - x B. 5 - x C. x - 500 D. 5 - 100x

A.5 150906

150907 A man is x years old now. How old will he be in 5 years time?

A. (x + 5) years. C. (5 - x) years.
B. (x - 5) years. D. 5x years.

A.5 150907

150908 Mary has \$x and gives away \$4.00 to each of her two girlfriends. How many dollars has she left?

A. x - 2 B. x - 8 C. 2x - 4 D. 2(x - 4)

B.4 150908

151001 The number which is 7 more than $3n + 2$ is

A. $3n + 9$ B. $10n + 9$ C. $21n + 2$ D. $21n + 14$

A.4 151001

151002 Joe the plumber uses the formula: $C = 3H + 7$ to determine the charge, C, for the work he does. He charges for the number of half hour units, H, or part there-of that he spends on the job. What is his minimum charge for a job?

A. \$3 B. \$7 C. \$10 D. \$13

C.4 151002

151003 In the playground there are x pupils and y dogs. Which statement about the number of heads and the number of legs is correct?

A. There are $(x + y)$ heads and $(x + 2y)$ legs.

B. There are $(2x + 2y)$ heads and $(2x + 4y)$ legs.

C. There are $(x + y)$ heads and $(2x + 4y)$ legs.

D. There are $(2x + 2y)$ heads and $(x + 2y)$ legs.

C.4 151003

151004 Which of the following could be expressed by the equation $10x + y = 15$.

A. The sum of the digits in a two digit number is 15.

B. The perimeter of a rectangle whose sides are 5x and y is 15.

C. The difference between 15 and a number is ten times another number.

D. I have 15 cents made up from 10 cent and 1 cent coins.

B.3 151004

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151005

Two cars, 1000 km apart begin their journeys, travelling towards each other. Car P is travelling at p km/h and Car Q at q km/h, as shown. After 2 hours the distance in kilometres between the cars is

A. $1000 - 2(p + q)$ C. $1000 + 2p + 2q$

B. $1000 + 2p - 2q$ D. $2(p + q) - 1000$

A.3 151005

151006 Two numbers m and n differ by 3. Their squares differ by

A. 3 B. 9 C. $3(m + n)$ D. $9(m + n)$

C.2 151006

151007 A litre of paint covers 50 square metres. What is the area in square metres of a wall which requires T litres of paint?

A. $\frac{50}{T}$ m^2 B. $50T$ m^2 C. $(50 + T)$ m^2 D. $(T - 50)$ m^2

B.2 151007

151101 *When three times the product of x and y is squared, the result is 36.* This can be written

A. $3xy^2 = 36$ B. $3(xy)^2 = 36$ C. $9xy^2 = 36$ D. $(3xy)^2 = 36$

151101

D.2

151102 I think of a number 'n', add 2, and multiply the result by 7. This can be written

A. $n + 2 \times 7$ B. $7n + 2$ C. $7(n + 2)$ D. $14n$

C.2

151103 An electrician can wire a house in w hours. His apprentice works at half this speed and is paid $10 per hour. How many dollars would the apprentice earn for wiring the house?

A. $20w$ B. $5w$ C. $\frac{w}{5}$ D. $\frac{w}{20}$

151103

A.2

151104 A train travels at the rate of t km per hour. In t hours it will travel

A. $\frac{1}{t}$ km. B. t^2 km. C. 2t km. D. t km.

151104

B.2

151105 Students are entering the school yard at a steady rate of n students per minute. If there were S students present at 8.30 am, then a formula for the number of students (T) present at v minutes past 9.00 am would be

A. $T = S + n + v + 30$ C. $T = S + (30 + v)n$

B. $T = S + 30 + vn$ D. $T = S + 30vn$

151105

C.2

151106 If the tens digit of a number is x and the units digit is y, the number has a value of

A. xy B. $x + y$ C. $10x + y$ D. $x + 10y$

151106

C.2

151107 A train left Sydney at r am and arrived at its destination at s pm the same day. The number of hours taken for the journey was

A. $24 - (r + s)$ B. $12 - r + s$ C. $12 - (r + s)$ D. None of these.

151107

B.1

151108 If four books cost $P, what is the cost of x books?

A. $\$4xP$ B. $\$\frac{4x}{P}$ C. $\$\frac{4P}{x}$ D. $\$\frac{xP}{4}$

151108

D.1

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